FOOD MANUFACTURE

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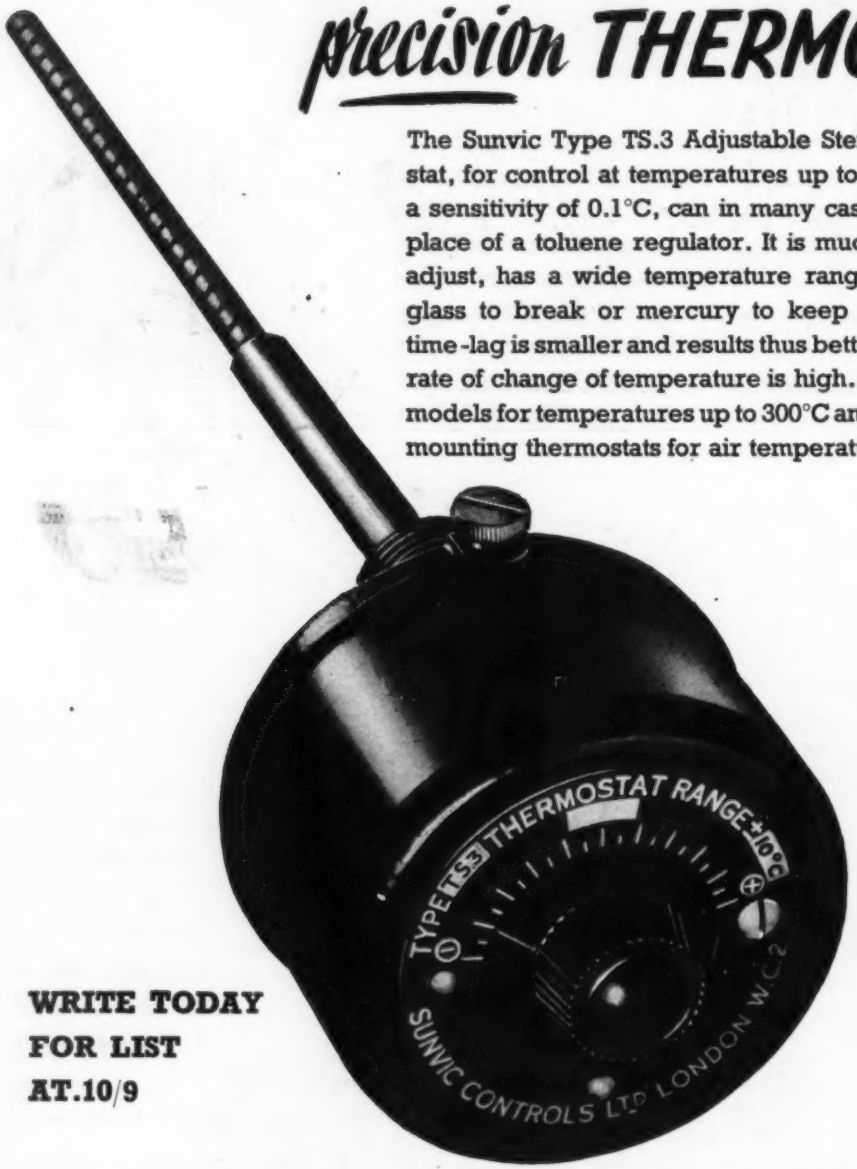


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# FOOD MANUFACTURE

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## The Meat Outlook

THE cut in the allocation of meat for manufacturing purposes is a direct result of the shortage of home-killed meat, supplies of which are not expected to reach the 1946 position for about three years.

Consumption during February and March of meat was 86,000 tons in excess of supplies. The figures for April were about equal, but this does not indicate that the meat ration is "safe."

The reduction in the present marketing of home-produced fatstock is not attributable entirely to losses of livestock during the recent frosts and floods. Another important factor is the heavy increase that took place last autumn in the slaughtering of all classes of livestock.

Slaughterings of cattle in September, October, and November last throughout the country totalled 684,600, against 552,900 in the corresponding months of 1945; slaughterings of calves totalled 522,700, against 446,700; and the number of sheep and lambs slaughtered was 2,896,200 against 2,157,900.

Thus, in these three months of 1946, 946,000 more head of livestock were killed than in the same period of 1946. Since last autumn's heavy slaughterings took place the agricultural disaster has deprived the country of 50,000 head of cattle and 4,180,000 sheep and lambs.

These factors explain the reduction in the output of home-killed meat at the present time.

In February, the latest month for which figures are available, slaughterings of fat cattle averaged only 17,300 weekly, compared with 23,100 a week in February, 1946; slaughterings of calves were 28,800 weekly, against 32,100; and of sheep and lambs 98,700 against 128,300 weekly. In order to maintain the meat ration increased supplies of imported meat are necessary.

The urgent need of restoring the livestock population is obvious. In the case of cattle, expansion is necessarily a long-term job, but in official quarters the view is held that beef production could be increased considerably by raising to maturity animals that are now being slaughtered as calves.

The feedingstuff position is believed to have turned the corner, in which case farmers may have greater confidence in their ability to feed calves to more mature weights; but the quickest means of expanding meat production is declared to be through pigs.

## Electronic Food Preservation

A half million dollar venture which may revolutionise the food processing, chemical, oil and drug industries was launched in New York over two years ago. A newly formed company, The Electronized Chemicals Corporation, set up a laboratory containing high-voltage apparatus capable of discharging millions of volts in flashes one-millionth of a second long, which they use to preserve foods and sterilise drugs.

There is nothing essentially new about the apparatus which is being used by the firm under the supervision of its designers, German atomic research scientists Drs. A. Brasch and W. Huber. Its novelty lies in its practical applications.

Hitherto, radiation has been of a continuous nature unsuitable for preserving food, which burned in the process. Brasch's apparatus with its millionth of a second discharge kills or inhibits bacteria and other organisms before chemical reactions have a chance to start. In addition, the discharge time and number of bursts can be controlled.

The heavy voltages are stored in banks of capacitators (the complete apparatus is called a "Capacitron") and as much as 4,500 volts can be discharged in one burst. The discharge passes through a vacuum tube into an irradiation chamber while a gas cathode gun provides the electron source.

Fifteen years ago Brasch demonstrated with a

prototype of his "Capacitron" that food could be sterilised without undue structural breakdown. Through the action of enzymes, however, the foods were adversely affected in taste, odour, and appearance. With the new apparatus both the enzymes and the bacteria are inhibited by sending more than one impulse through the food. By freezing the food before radiation, small traces of hydrogen peroxide which give food a bad taste are prevented from forming.

Foods which have been preserved by irradiation for two to three months or longer include raw meats, poultry, shrimps, oysters, dairy products, most vegetables, eggs, and some fruits, and it is ultimately aimed to be able to keep any food almost indefinitely under any conditions. In Dr. Brasch's opinion the process will in some instances replace quick-freezing and dehydration.

In an article in *Science* (January 31, 1947) Drs. Brasch and Woolfgang present in detail some experimental results. They have found that lean beef, poultry, and eggs are the most easily preserved in the series of proteinous foods, while in the case of vegetables, green peas, mushrooms, and tomatoes give satisfactory results. An irradiated steak was unchanged for all practical purposes after storage in the incubator at 37·5° C. for twelve days. The authors close their communication by saying: "Although a deal of exploratory and development work is yet to be done, there can be no doubt that a process which, among other things, permits preservation in a raw state and causes chemical and biological effects of such a highly differentiated nature, will be found useful in many applications beyond those already reported." They add the warning that: "An important consideration for practical purposes, will be whether or not the operating costs of such a device are prohibitive. Detailed estimates show that such expenditures will not materially increase the final price of the treated product provided that the output of the Capacitron is adapted to the required purposes."

That there exists a certain amount of scepticism for the claims put forward is shown by a quotation from an article on the subject in *Fortune* (March, 1947). Commenting on the firm it is said: "It may prove itself almost overnight . . . or this may be the last time readers hear of 'Electronized Chemicals.'"

In view of the great future expected for quick-frozen foods any process which has a similar object—the preservation of foods in their fresh state with the least possible modification—cannot fail to be of importance to the industry and further details of this development will be awaited with interest.

## More Sugar for Britain

Allocations of sugar to the United Kingdom for 1947 total 112 per cent. of the 1946 quantity, and may be increased to 119 per cent. if certain supplies from "undesignated" sources are available. The total world supplies of sugar available for export this year are estimated at 7,771,000 tons, of which 4,243,000 tons (55 per cent.) are from Cuba and 658,000 tons from undesignated sources. This latter quantity provides the element of uncertainty regarding Britain's total supplies for the year.

Expert opinion is that even with the most propitious weather and a bountiful harvest world supplies will not equal the demand. Suggestions that sugar confectionery and jam could be freed from rationing are therefore considered to be premature.

Sugar production in the United Kingdom in 1946-47 totalled some 520,000 tons and was well above the disappointing level of the previous year.

Total disposals of sugar in the United Kingdom in 1946 averaged 34,900 tons weekly. Monthly imports last year averaged 122,500 tons against a pre-war average of 180,000 tons. An increase of 19 per cent., the most that Britain can hope for this year, would raise the average level of imports to 144,900 tons a month. This is still about 36,000 tons a month below the pre-war level, which is considered to be the minimum imported quantity that would permit of the abolition of sugar rationing.

## Boxed Beef

In Eire, full of English holiday makers, "meat for England" is the burning topic of the hour, and the controversy rages round the steak and Guinness-laden hotel tables from noon till night.

The policy of the British Government in not paying as good a price for Eire cattle as is done for cattle from Northern Ireland is discussed and criticised. Irish people allege it to be entirely illogical that the British Government should have, for some time past, condoned what appears to be a breach of the rationing regulations by allowing private individuals to buy meat from Eire much

in excess of their ration, and at a price which was almost a black market one, while refusing to arrange a better price for Eire cattle "on the hoof" exported in the normal way. It is pointed out that meat imported in this way might have been pooled and a better ration would have resulted all round, and that even if the subsidy had been increased, the money would have paid dividends in health—if not in hard cash.

That these "gift" parcels were hard cash transactions is a fact which has been accepted by everyone, and it is asked, "Who paid for the meat in the end?"

A much discussed point is the condition of the meat which was sent in these parcels, and over which there was exercised very little control. The *Irish Times*, commenting on shops which apparently carried out an exclusive trade in dispatching them, said that this was done "under filthy conditions." Despite this, sympathy is felt for the large number of people in Britain who, through the banning of the meat parcels by the Eire Government, will miss this welcome addition to their rations.

Surmise in Eire is rife. Is Mr. Strachey, it is asked, hoping for the removal of the ban on gift meat parcels? Does he not approve of buying "cattle on the hoof" and think "boxed beef" is better? Does he, like Charles Dickens' immortal butcher "who had sentiment for his trade and could refine upon it" (that butcher who, inserting reverently the cabbage-wrapped steak into his client's pocket, remarked with some emotion, "Meat must be humoured, not drove") think the whole British cuisine should be revised, after the fashion of the *Regimen Sanitatis* of Salerno:

"Salt meates, red Deere, Hare, Beefe, and Goat: all these
Are meates that breed ill bloud, and Melancholy,
If sicke you be, to feed on them were folly."

So runs some of the sprightly comment which is current where Dubliners do congregate.

## Blackening of Cooked Potatoes

The agronomic or agricultural aspects of the cause of blackening in cooked potatoes have been much investigated in this country and elsewhere without any very clear-cut result. What appears to be the first approach to chemical characterisation of the substance responsible for the discoloration of potatoes on cooking has been made by W. R. Lewis and D. M. Doty, of Purdue University, Indiana, who reported their preliminary findings in the *Journal of the American Chemical Society*, **69**, 1947, pp. 521-525. The compound responsible for the black pigmentation has been only partially characterised, but its precursor exhibits a marked blue fluorescence under ultra-violet light, with a maximum of absorption at about 2,800 Å. This precursor is colourless, and is converted to a black pigment at temperatures as low as 35° C., even in acid solution and in an atmosphere of carbon dioxide, turning black instantly in alkaline solution. On account of the instability of this substance when heated, its concentration from an extract of raw potatoes could be accomplished only by evaporation under reduced pressure so that the temperature never exceeded 30° C. The precursor contains a carbohydrate and a nitrogenous group.

Concentration of the precursor was followed by noting the fluorescence of the various fractions, but it is not clear from the paper whether susceptible raw potatoes can be relied upon to exhibit an appreciable fluorescence under ultra-violet light or whether the fluorescence offers any rough sorting test for potatoes liable or not to blacken on cooking. There is hope, however, that after trials of many varieties of which the behaviour on cooking is known, a simple fluorescence test can be devised to decide whether a batch of potatoes of unknown or unnamed variety will be apt to blacken when cooked. Whether such a test will be simpler or more reliable than a sample cooking test remains to be seen.

## Fortified Food

Coming down strongly on the side of the fortification of foods with synthetic vitamins, Dr. Robert R. Williams in a paper read before the American Section of the Society of Chemical Industry, jointly with the American Chemical Society, the American Institute of Chemical Engineers and the Electrochemical Society in New York, spoke of the enrichment of white bread and flour as cheap insurance costing about 20 cents *per capita* for substantially the entire American people against deficiencies of the nutrients added.

"The need for such insurance is indicated by the widespread occurrence in clinical practice of

conditions which respond to vitamin therapy. Statistically there is a certain probability of these deficiency conditions affecting individuals in every level of society, but it is higher among low-income people. Daily dosing with vitamin tablets would not have become so prevalent if there were not something in it. The truth lies somewhere between the panegyrics of the radio advertisers and the denunciations of vitamin purveyors by iconoclasts. Vitamin tablets are harmless and we can safely leave it to the public to decide how much benefit it derives and how much it is willing to pay for them. Many scientists use them and feel that they benefit by them."

We cannot entirely agree with Dr. Williams' argument about "daily dosing." Just because a lot of people use a thing does not prove its efficacy, although in the particular case of the vitamins it may be so. Daily dosing with patent medicines, some of them roundly condemned by the medical profession, is a case in point.

In connexion with the fortification of flour, Dr. Williams dismisses the argument that overmilling may take out more valuable nutrients from the loaf than can at present be put back.

Dr. Williams hits the nail on the head when discussing the enrichment of maize meal which, he said, is progressing very slowly in comparison with wheat because it is produced by thousands of small mills. He cites this as an example of the fact that the organisation of a food industry determines the *feasibility* of a particular public health measure far more than do the cold scientific facts about nutritional needs. The word "feasibility" is the operative one.

## Rooks in Britain

The report now being prepared for the Agricultural Research Council by the British Trust for Ornithology's Rook Investigation fully bears out in the advance summary all one associates with this wide-awake bird. "To rook" meaning to cheat; that invariable translation of the word, as given in one of Scott's works, "you rooked me at piquet last night," is general. And there is "rookery," signifying a densely populated area frequented by thieves, now fully confirmed by conclusions of the Trust. Over 1,500 rooks shot to investigate their preferred food from scattered feeding-grounds show 12 per cent. of "harmful animals" in their diet; but against this must be given 82 per cent. vegetable feeding, of which 36 per cent. is stubble corn and 38 per cent. "vulnerable corn." A total of 51,500 tons of corn annually is an estimate of the loss caused by two and three-quarter million rooks. The bird follows British agricultural activities in varying its diet to utilise whatever is to hand. Differing from crows in being social birds (among themselves), feeding in flocks, posting warning sentinels, rooting up grass and corn, here is a pest hardly deterred by scarecrows and one to be watched with harvest yields so vital.

## A Fair Swap

The remarks of a speaker at the recent conference of the Advertising Association, when he told how those "economic disaster" placards adjuring us to work harder had failed to "ring the bell," are worth recording. Rather must the worker be told, he argued, "that every car he sends off the assembly line means so many tons of wheat, or meat, or groundnuts." When goods and not gold are only available, when dollars or credit simply are not there to pay our way, back we go to barter, to the old system of swapping, a system known from our schooldays, halcyon days when anything from marbles, foreign stamps, boiled sweets, and other odd commodities conjured from our pockets served as currency which was ever current in hard bargaining. That the barter system, even when practised by grown-ups, still has its titillating points is seen in the many advertisement columns of a contemporary journal, where anything from a wireless set or hair-waver or even a set of Waverley novels is offered—"with cash adjustment"—for equally diverse requirements of the owners of these. Out into the wider world and one hears of the Melbourne Zoo offering a live platypus in exchange for a kiwi's egg; of a Hungarian circus proprietor offering (and having accepted) seven lions and a matter of thirteen monkeys in lieu of income tax. The Illinois agricultural students who offered to pay college fees in farm produce saw a novel way of exchanging the "cow gown" for the graduate's robes!

**TO AUTHORS**

FOOD MANUFACTURE is prepared to consider the publication of any books on scientific and technical subjects which authors might care to submit.

# Fork-Trucks in Food Handling

FRANK H. SLADE, A.M.I.Mech.E.

**There is little doubt that the need to increase production and conserve manpower has never been greater in this country than at the present moment. While there exist a number of means whereby these desired savings may be effected, there is none more apparent than in the handling of plant materials.**

IT has been determined that 20 per cent. to 50 per cent., or even more, of the total cost of producing many items, lies in the expense of moving work about the plant. These excessive handling costs, however, are often effectively hidden by older costing methods which allocate the cost of moving work to production costs, instead of segregating handling costs.

Many manufacturing industries have taken steps to uncover these "hidden" costs, and, as a result, where materials are handled in sufficient quantities to make pallet or unit-loads, the fork-truck-pallet system of handling and storage has been applied. This, together with intelligent integration with other systems of handling, has in some cases achieved as much as a 25 per cent. reduction in handling costs due to more efficient methods.

While the now familiar low-lift-truck stillage system contains within itself means of picking up, transporting, and setting down with no manual or other handling, the fork-truck-pallet system contains the additional features of tiering and of being able to handle work platforms of less clearance.

This platform, now universally termed a pallet, was introduced by manufacturers who, wishing to conserve natural storage space and to provide for long period storage at reduced cost, realised the limitation of the stillage for this purpose, which in many cases required the employment of dunnage to prevent damage to materials upon which they were superimposed.

The pallets used for tiering provide for this storage specification in that by its use not only is headroom saved per unit load, up to one-third to half the height of a stillage, or as much as 8 in. to 12 in. where dunnage is employed, but they have a wider load distribution when double-faced pallets are used, or the broad flat top and bottom distribute the load over a wider area, thus providing for a firmer and less harmful pack.

It was apparent that pallets needed a specially designed truck for their horizontal and vertical

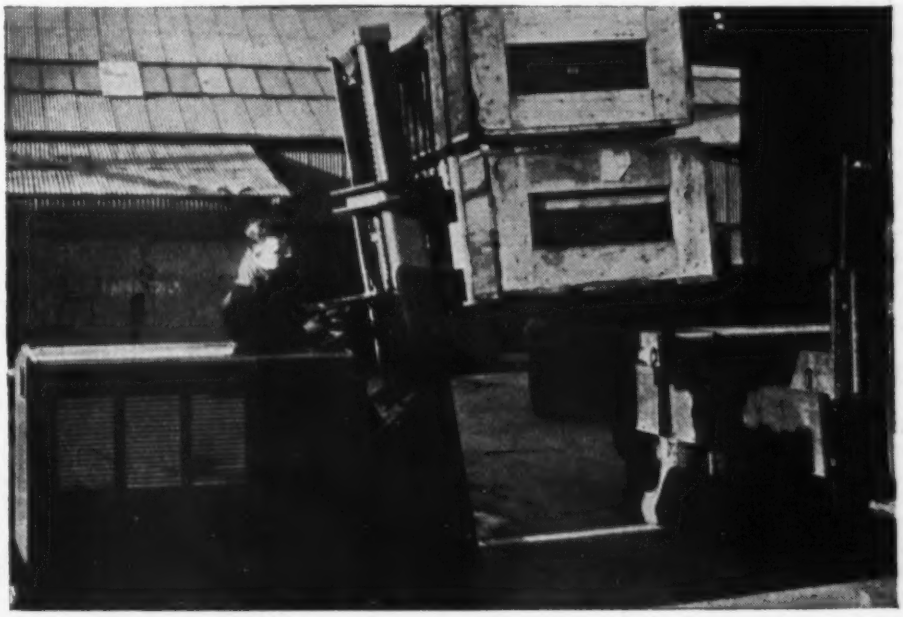

**Fig. 1. — Double handling of materials is avoided in the loading of common carriers from storage or production line, as is illustrated by the fork-truck handling crated goods directly into a waiting lorry.**

*Courtesy Electro-Hydraulics, Ltd.*

**Fig. 2. — Boxed goods are loaded directly on to pallets from the production line, which is elevated and carries the goods as shown.**

*Courtesy I.T.D., Ltd.*

movement, hand and power-operated equipment employed for this purpose needing unimpeded floor space to allow this to reach the lift position under the load.

The design of the fork-truck obviated these difficulties, also others, such as the reduction in width of truck operating aisles by the development of short wheelbase fork-trucks, thereby conserving additional storage space, and the provision of a means for handling heavy loads by scientific counterbalancing of the truck chassis with self-loading and unloading characteristics.

While the use of fork-trucks for the storage of unit loads may be emphasised, their use is by no means limited to this sphere of operation, for the loading and unloading of common carriers, as shown in Fig. 1, especially of palletised loads, considerably reduces handling time and costs, while the uses for which they may be employed in intra-plant materials-handling, with or without the use of ancillary equipment, are manifold.

**The Construction of Pallets**

Pallets may be made either of wood, soft or hard, in accordance with service requirements, steel, or metal alloy. The availability of wood in the United States led to the almost universal use of this material there, either in board form or plywood; however, the scarcity and high price of wood in this country means that the metal pallet offers lower costs, especially when maintenance of the two forms of construction is considered.

For tiering unit loads, the pallet must not only be strong enough to withstand impact bending, or the strain induced by loads dropped upon the pallet or by a loaded pallet being dropped, but also static bending induced by dead loads; the upper surface of the palletised load must be such that when loads are superimposed a safe stack is secured, also the materials loaded on the pallets must be strong enough to withstand superimposed loads.

Care should be exercised in the choice of pallets to suit the materials to be handled, more especially as pallets often represent the major capital expenditure in the installation of a fork-truck-pallet system, and incorrect pallet sizes will detract from operational economies.

American practice indicates a pallet size of 48 in. × 48 in., of varying types, such as double-faced pallets for the tiering and storage of materials, double-faced four-way pallets providing accessibility from lateral or cross aisles similar to that from main aisles, special double-faced cargo pallets for the handling of unit loads by fork truck and slip sling, and single-faced pallets for the movement of unit loads by common carrier.

The practice in this country is to construct a pallet of pressed steel of varying sizes according to the nature of the load to be stacked or transported, and in accordance with the size of the common carrier employed.

The photographs reproduced in Figs. 2 and 3 illustrate the use of steel pallets for handling boxed materials.

It is stated by authorities on pallet manufacture that where pallets are to be handled by road transport, they should not exceed 42 in. to 44 in. width, so that they can be easily accommodated on a standard trailer or lorry body of 9 ft. to 7 ft. 6 in. in width; the length of the pallet is not of such great importance, but for a lorry 12 ft. long, pallets 6 ft. or 4 ft. in length would be most suitable. Therefore, it would appear that standardisation of pallet sizes is advantageous where those are in use outside of the plant of origin as well as inside that plant, such as 40 in. × 48 in.

Practically all types of goods can be "palletised," such as cased, crated, and boxed goods, cartons, sacks, bales, drums, etc., the type of pallet depending upon the nature of the goods to be handled, one of the essentials being that the pallet must provide a space underneath the stores to allow the fork-truck either to pick up or release the load. Some stores do not need pallets, such as barrels or large packing cases with thick battens underneath; some can be stacked on strips of wooden dunnage, others may need a simple framework, or are more easily handled when made up into unit loads bound with steel strapping.

## Stowage of Materials

The correct loading and stowage of materials in stores has the effect of conserving time and space and reducing cost of handling, especially where the turnover is fairly rapid and continuous. Correct technique in loading a pallet will add to the stability of the unit load, therefore bags, bales, crates, boxes, or pieces not having square dimensions, should be cross-bonded, as indicated in Fig. 4, in order that the materials should be keyed and locked in place.

Reduction on the loss of space caused by the partial withdrawal of lots in storage, leaving spaces which cannot be filled until the pallets of the same lot of material are removed, is effected by angle stacking at 45°. The materials are stacked in a centre location so that removal of materials can be made from four aisles, representing an ideal method of stowage for stores from which materials are to be withdrawn at frequent intervals, reducing honeycombing of space, and affording better control of the lengths or rows of palletised or stored materials.

Uniform "ceiling stacking" in stores makes the fullest use of available floor space, eliminating considerable manual labour and the use of special hoisting gear, enhanced in that fork-trucks, by their manoeuvrability, can easily operate in narrow aisles between stacks of materials.

With each standard load stacked squarely on its pallet, the resultant pack is firm and stable, and the risk of condensation and spontaneous combustion is reduced by the free circulation of air through the hollow pallets in the stack, these acting in the same manner as dunnage in ships' hold stowage.

## Tons Per Man-Hour

The advantages of the fork-truck-pallet-system are listed by the Industrial Trucks Statistical Association of Chicago, as follows:

1. Substantially lower handling costs.
2. Rapid movement of goods.

**Fig. 3.—The process of elevating and depositing the load is carried out with rapidity.** *Courtesy I.T.D., Ltd.*

**Fig. 4.—Palletised sacks are interlocked and stacked one upon the other, thus employing the maximum warehouse space available.**

3. Modern trucking methods fundamental to such a system reduce costs.
4. Maximum utilisation of storage space.
5. Reduction in product damage through less manual handling.
6. Enhancement of employees' safety.
7. Reduced time and cost in taking physical inventory.
8. Reduced time for loading and unloading railroad cars, lorries, ships.
9. Improved ventilation in storing perishables.
10. Simplification of vermin control.

Many of these are not only apparent, but complementary to each other, arising from manpower and space savings effected, also by the avoidance of the rehandling and man-handling of materials.

Floor space is conserved by mechanical tiering, the avoidance of intermediate handling, and rehandling at loading points; commodities being immediately conveyed to and from the common carrier, instead of being packed on platforms or loading stages, to be either loaded or conveyed to where required after being unloaded.

These facts, together with manpower conservation claims, are exemplified by the operational example shown below.

In a recent test over operations (*d*) to (*f*) only, 100 lb. cases were used and a fork-truck operated by a girl competed against two experienced men with a hand-trolley. After one hour the girl and fork-truck had shifted and loaded 18,000 lb. to each man's 1,500 lb., thus showing a performance ratio of 12 to 1.

It has been reported that handling costs have been reduced from 35 per cent. to 50 per cent. by the use of palletised loads, and in extreme cases performance ratios of up to 26 to 1 shown.

The production efficiency for manual labour directly engaged in handling materials is expressed in tons per man-hour. This is the true yardstick for measuring efficiency of all materials-handling.

The total tons handled, divided by the total hours engaged, equal T.P.M.H.; thus for the example previously quoted, T.P.M.H. for the manual handling operation equals 0·67, while for the fork-truck operation the factor equals 8·04.

This method of evaluation can be applied to re-

| *Operation.* | *Old Method.* | *Palletised Stores.* |
|---|---|---|
| (*a*) From lorry or railway wagon to storehouse truck | Man-handled | Goods man-handled on to pallet to form unit loads at convenient height. |
| (*b*) Truck moved to storehouse | Man-handled or power driven | |
| (*c*) Stores from truck to stack | Man-handled | Handling operations (*a*) to (*f*) carried out by a fork-truck and driver. |
| (*d*) Stores from stack to truck | Man-handled | |
| (*e*) Truck moved to lorry or railway wagon | Man-handled or power driven | Loaded pallet lifted to convenient height by fork-truck, and unit loads broken down or goods man-handled off pallets. |
| (*f*) Stores from truck to lorry or railway wagon | Man-handled or power driven | |

veal misapplied handling equipment; for example, in order to show what low production is in relation to time element, a time study of an unloading operation was carried out; the working conditions were that a wagon holding 15,952 tons of carton-packed goods had to be unloaded and placed into warehouse storage. The average trucking distance was 250 feet. The following personnel and equipment were being used for this operation: eight men loading in wagon, one checker, six truck drivers (three fixed and three elevating platform trucks), eight men at warehouse storage, and one foreman, making a total of twenty-four men, which for the complete unloading and stowage operation meant a total of thirty-six man-hours. This for the load handled shows a T.P.M.H. of 0·44, which indicates that too many men and too much equipment of the incorrect type increased the time factor and lowered the T.P.M.H., with corresponding high cost per ton.

By co-ordinating the proper method and equipment with reduced manpower, it was observed that with four men loading in the wagon, one checker, and one truck driver (one fork-truck)—no men being required for warehouse storage—the work was completed by six men in one hour, or 15·952 for a total of six man-hours, making a T.P.M.H. of 2·66.

**Fig. 5.—Ancillary equipment, quickly attached, can be employed for special handling work.** *Courtesy I.T.D., Ltd.*

**Integration with Other Systems**

It should be stressed that the co-ordination of handling methods should not be overlooked, or even the combination of mechanical and manual materials-handling — for example, "set-down" operations, or the handling from operation to operation in certain instances is preferential to any form of mechanical handling equipment.

Analysis in industries where small part production and assembly are carried out, resulting in a series of small production lines, may show, especially where production rates are constant, that some form of continuous conveyor is better suited. There are also cases where work is carried out by a conveyorised process, wherein the handling operations approach the ideal. Power trucks form an integrating link where products from the foregoing manufacturing processes are cartoned or packed.

However, when the choice of a handling system is under review, it should be remembered that the ideal handling system is one containing no lost motion, and requires no manual handling, and this ideal is most nearly approached in the fork-truck-pallet and the low-lift-stillage systems.

When loads are heavy and tiering is unimportant, the low-lift-truck system has advantages over the fork-truck-pallet system in that loads are not carried in an outboard position, and no counterweight is needed; as a result, less dead weight must be moved for a given load. Where the volume of work warrants, both systems can be used, the fork-truck-pallet system for tiering and loading, and the low-lift-truck-stillage system for other hauls.

Distances are a factor where the tractor-trailer system has advantages, in that cost per ton-foot is less. However, the tractor-trailer system must be provided with an external means of loading and unloading, for if these operations have to be performed by hand, the cost might easily outweigh the saving in haulage costs.

The fork-truck-pallet or lift-truck-stillage system may be integrated with it; by the simple expedient of using the lift or fork truck for setting pallet or stillage loads on the trailers; a truck would also be necessary for unloading at destination if rehandling of individual pieces is to be avoided.

**Fork-Truck Types**

A fork-truck is not only equipped with load-carrying mechanism, but also tilting mechanism to handle the load, and to facilitate unloading, giving a 10 to 15 degree backward tilt in the carrying position and a 3 to 5 degree tilt in the unloading position.

This type of truck may be either telescopic or non-telescopic, fitted with a fork of two prongs to be thrust beneath load-carrying pallets, as well as other forms of load-carrying attachments, such as a single or double ram for insertion in coils or circular ring-type packages or unit loads; for bulk commodities there are scoop trucks that shovel by the ton with the same dexterity that a man shovels by the pound, and can also elevate and discharge the materials into hoppers or bins. There are also jib attachments as shown in Fig. 5; swivelling carriages, etc.

Modern construction demands that the operator's driving position affords an unobstructed vision of the fork tips, when the load is being picked up or placed, the fork carriage hoist and upright or mast tilt units being mounted ahead of the operator.

Generally speaking, the modern truck is extremely simple to drive, but, in order to secure the best results, the training of all drivers should be ensured.

The trucking system should be planned in accordance with the plant layout and class and volume of materials to be handled; by such means the maximum working time may be secured during the life of a truck, realising its maximum efficiency. This should prove considerable, especially in view of the fact that there have been many instances where a truck has returned its initial cost within a year, operating for one hour only per day.

## Pollution of Rivers

THE health of the people of this country depends to a great extent on the purity of their drinking water and the effective disposal of sewage and trade waste waters. Many new and urgent problems arose during the war, and most of them are of equal importance in peace. The story of how these problems were tackled and overcome is told in a Report* which stresses the importance of consultation with the Water Pollution Research Laboratory by industrial firms before a new factory is built or a new process is undertaken at an existing factory. The work of this Laboratory, under Dr. B. A. Southgate, is concerned with any matters affecting the purity of surface and underground water, and includes research on the treatment of water, on the treatment of sewage and industrial wastes which may cause pollution, and on the effects of polluting substances when discharged into rivers, streams, or lakes. The Report includes descriptions of work on the treatment of waste waters from a large number of industrial processes, ranging from the filling of shells with high explosive to the boiling of garbage for pig food.

The Report contains many examples of research undertaken for the disposal of industrial waste waters. Among these are milk washings and whey washings from dairy and cheese factories, waste waters from the manufacture of cellulose from sawdust, and of beet sugar.

In the drying of vegetables the waste waters are generally similar to those produced when vegetables are cleaned in the ordinary household. The volume discharged at a factory, where some 40 tons of vegetables may be processed in a day, is very large and there would often be severe pollution if the liquid were discharged untreated to a stream. A study of the composition and volume of the waste waters and possible methods of treatment was carried out. As a result it is now possible to choose the sites for vegetable-drying factories so that the waste waters can be disposed of with the least expenditure of manpower and materials for special treatment plant, and at the same time without causing serious pollution.

Descriptions are included of several investigations of methods of treatment of water which were rendered necessary by war-time conditions. For example, chlorination of water was widely adopted as a safeguard in case polluting substances entered water mains damaged by bombing, and the Laboratory was asked to determine whether small concentrations of chlorine increased the corrosion by the water of taps, ballcocks, and other fittings. Again, during the war, it was impossible to obtain bitumen for coating pipes of cast iron and steel to protect them from corrosion, and many substitutes made from tar were tested to ascertain whether they would impart taste and odour to water under service conditions.

* *Report of the Water Pollution Research Board of the Department of Scientific and Industrial Research for the Period 1939-1945.* H.M.S.O. 1s. 3d. net.

## BOOKS RECEIVED

*The Chemical Constitution of Natural Fats.* By T. P. Hilditch, D.Sc.(Lond.), F.R.S., F.R.I.C.

*Modern Cereal Chemistry.* By D. W. Kent-Jones, Ph.D., B.Sc., F.R.I.C., and A. J. Amos, Ph.D., B.Sc., F.R.I.C.

*Food Inspection Notes.* By H. Hill, F.R.San.I., F.S.I.A., A.M.I.S.E., and E. Dodsworth, M.R.San. I., M.S.I.A.

# Detergency in the Food Industries

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**Part III**

BUFFERING is the ability of a detergent solution to withstand small additions of acid without much loss of *p*H. The buffering properties of a substance become most pronounced in the region of *p*H 8 to 9 where in some cases relatively appreciable amounts of acid can be taken up without change of *p*H. The principle on which buffering operates can best be demonstrated by considering a solution of sodium acetate. In this solution some of the sodium acetate will hydrolyse, giving caustic soda and acetic acid:

$$CH_3.COONa + H.OH = CH_3.COOH + NaOH$$

The caustic soda formed will ionise to $Na^-$ and $OH^-$ ions, but the acetic acid will hardly ionise at all. Therefore, the solution, having a preponderance of hydroxyl ions, will be slightly alkaline. If a little dilute acid is added the hydrogen ions thus provided will unite with some of the hydroxyl ions to form water:

$$H^+ + OH^- = H_2O$$

and the *p*H will thus tend to be reduced, but immediately a further quantity of hitherto unhydrolysed sodium acetate will hydrolyse, providing further hydroxyl ions and restoring the *p*H *status quo*. This process can continue so long as unhydrolysed sodium acetate remains in the solution.

If acetic acid and sodium acetate are mixed together in solution, it will maintain its *p*H against small additions of acid or alkali, and such a mixture is often used for buffering purposes in chemical and biological processes.

It has been mentioned that this effect is mainly concerned with the moderate *p*H figures, and with highly alkaline solutions used in detergency; usually "buffering" means the ability of the detergent to maintain its high *p*H in spite of the action of small amounts of acid. Obviously, in this type of "buffering" caustic soda shows up very well, whereas in the true buffering previously described, as the *p*H drops below 11 the resistance in caustic soda practically vanishes. It is, therefore, necessary clearly to define what is meant by the term "buffering" in the detergent connexion. Resistance to lowering of high value *p*H might be a better description.

It is possible to obtain a "buffer" index for any detergent by correlating *p*H changes during titration with addition of small amounts of acid. The index is usually given as the amount of *p*H charge per unit volume of acid. The *p*H range should be specified. For practical detergency purposes the *p*H range 12 to 10 or 11 to 9 is most significant.

**Sterilising Power and Sterilisation**

Much work has been done on this point as far as caustic soda itself is concerned by Toulouse and Levine, and Buchanan and Levine in the United States: by Mattick and Roy, Mattick and Sharpe, Hobbs and Wilson, and other workers in this country, mainly in relation to dairy work. It is generally agreed that there is a relationship between the time of contact, the temperature, and the concentration of the detergent which is such that if one is held constant the other two vary inversely to one another; that is to say, if the temperature is constant then if the concentration or alkali is reduced, the time of contact must be increased. As a result of this work it has been generally insisted that for food industry detergency as high a degree of caustic alkalinity shall be maintained as is possible while the temperature shall also be high, and these conditions are especially important for machine bottle and container washing. For plant and equipment sterilising with steam or hypochlorites is usual, but these should only follow thorough detergency.

It is now known that the addition of wetting agents to detergents enhances the killing power of any caustic alkalis present, so that this is another good reason for the use of wetting agents in food detergency. Nevertheless, it is not usual to rely solely upon the detergent for the destruction of bacteria. The cleaning or detergency stage is usually followed by a separate sterilisation procedure. This may be steam (or boiling water) or by treatment with a solution of sodium hypochlorite. Which of these methods is to be used depends upon the plant and circumstances. The use of sodium hypochlorite solutions, for instance, has increased because of the fuel shortage; the difficulty of supplying steam and boiling water in sufficient quantity has forced plant operators to adopt the "cold sterilisation" procedure using hypochlorites.

In using steam or boiling water it is important to ensure a proper length of time of contact, in order to permit the metal to reach 212° F. and for the

bacteria to die. Two minutes is usually given as the minimum for efficient heat sterilisation.

Where solutions of sodium hypochlorite are used it is rarely necessary to use more than 300 p.p. million of available chlorine to obtain excellent results in five or ten minutes' contact. Solutions of sodium hypochlorite as sold commercially contain approximately 10 per cent. available chlorine, and this is stabilised so that the liquid may be stored for many months without deterioration. Using dilutions of 2 or 300 parts per million available chlorine and following this with a clean water rinse the surface is left in a near-sterile condition. Objections have been raised about the corrosive properties of hypochlorite, but under ordinary practical conditions the danger of corrosion is negligible. Even with aluminium the attack at 200 parts per million is not noticeable except where impurities in the aluminium lead to staining. If the aluminium has been anodised no attack takes place even with long periods of contact. It should be emphasised that all sterilising procedures should follow *thorough detergency*. The sterilising process should be carried out as soon as possible *before* the plant is used again; the detergency operation should take place immediately *after* the plant or equipment has been in use.

## Water Softening and Scale Prevention

As previously observed the importance of water in the food factory is very great. The primary consideration from the detergency point of view is hardness. Water up to 6 parts per 100,000 total hardness can be considered as very satisfactory; beyond that progressively less so. Waters of up to 40 parts per 100,000 are often encountered in hard water districts. In such cases the water supply to a factory should be unquestionably softened, if not completely at any rate down to 10 or 12 parts per 100,000 of hardness. The quality of the water from the bacteriological standpoint is also important as the rinsing with contaminated water will undo the work previously carried out. Water from public water mains is invariably controlled and is satisfactory from this point of view, but the large number of factories have their own artesian wells for water supplies, and it is important that such sources should be examined at regular intervals in order to ensure that no contamination is taking place. Well waters are often found to vary in chemical content during a period of years and consequently variations in hardness are found. Chalybeate (ferruginous) waters obtained from wells can often give considerable trouble in depositing ferric hydroxide with the liberation of active carbon dioxide which may be a cause of corrosion in machine and on metal surfaces. In mountainous districts water will often be quite soft and sometimes the *p*H is as low as 6, which means that the water is slightly acid and consequently will tend to be slightly corrosive.

Storage tanks for water in food factories should be periodically inspected and where necessary disinfected. Final rinse water for all detergency processes should be in good bacteriological condition.

## Methods of Water Softening

The common alkalis, caustic soda and sodium carbonate, will soften water by precipitating the hardness, and, therefore, it may be taken that in the detergent solution the problem of softening solves itself. The salts precipitated during the process may, however, give rise to trouble because being insoluble they may adhere to surfaces and cause a filmy appearance, or they may build up a crystalline scale, as in certain kinds of plant and washing machines. This may not occur if the detergent solution has high deflocculating powers. Detergents which contain wetting agents, silicates, phosphates, colloidal starch, or mixtures of two or more of these, will be beneficial in this connexion. The use of sodium hexametaphosphate to hold the hardness cations in solution is also to be recommended; ·05 per cent. of this substance in the detergent solution is sufficient to achieve the desired result. The mechanism of this method will be discussed later.

Water softening may be achieved on a commercial scale either by means of using a lime-soda softening equipment or base exchange (zeolite) water softener.

The properties of the several detergent substances with respect to the sections discussed above are summarised in the table below:

| | *Caustic Soda.* | *Sodium Metasilicate.* | *Trisodium Phosphate.* | *Sodium Carbonate.* | *Sodium Hexameta-phosphate.* | *Siliceous Silicates.* | *Soaps.* | *Synthetic Organic Wetting Agents.* |
|---|---|---|---|---|---|---|---|---|
| Caustic alkalinity ... | ++++ | +++ | ++ | ++ | o | ± | ± | o |
| Wetting ... ... ... | + | ++ | + | ++ | + | +++ | ++++ | ++++ |
| Deflocculating and emulsifying power ... ... | ++ | +++ | ++ | ++ | +++ | +++ | ++++ | ++++ |
| Rinsing ... ... ... | + | ++ | +++ | ++ | ++++ | +++ | + | +++ |
| Scale prevention ... | o | + | +++ | + | ++++ | +++ | o | +++ |
| Sterilising power ... | ++++ | +++ | +++ | ++ | o | + | +++ | ++ |
| "Buffering" (*sic*) ... | ++++ | +++ | +++ | ++ | o | ++++ | - | - |

### Tanks and Large Vessels

In most cases the materials required will be governed by the type of surface to be cleaned, thus in the case of storage tanks, processing vats, and other large receptacles, variation will be required between aluminium, copper, tinned surfaces, and vitreous enamel. Aluminium requires either a detergent based on sodium carbonate inhibited with sodium metasilicate or detergency solutions based on low alkalinity silicates and wetting agents. Tinned surfaces may be cleaned with strongly alkaline detergents provided that where high caustic alkalinity is involved a proportion of sodium sulphite not less than 25 per cent. is used in order to inhibit the attack on tin. Where detergents of low caustic alkalinity are concerned the percentage of sodium sulphite necessary for inhibition may be reduced to 10 per cent. Liquid detergents based on the more siliceous silicates are particularly useful for tinned surfaces as well as aluminium. For vitreous enamelled surfaces the best and safest detergent is a solution of alkyl sulphate wetting agent with no alkalinity present at all.

### Portable Vessels Including Churns

The same remarks apply to aluminium and tinned vessels as above. Milk churns are recognised for their difficulty in cleaning and sterilising. Steam or hypochlorite sterilising should follow after efficient cleaning with a suitable detergent. Occasionally cases are found where cleaning of vessels consists of a hot water rinse only. This means that there is a considerable film of residual food left behind. It must be pointed out that there is still in the vessel sufficient food to ensure rapid growth of bacteria should the receptacle become reinforced, which it very often does, particularly during summer. Hence, when a fresh supply of the food material is placed in the vessel it may not be in a fit condition to receive it. This should emphasise the importance of thorough cleaning before sterilisation, whether by means of steam or hypochlorite.

The practice of washing tinned churns with strong alkalies containing no inhibitor is destructive and dangerous, since the corroded surface will ensure a most effective foothold for bacteria and will increase the difficulty of producing a sterile churn. Machine churn washers of various types are in use and all of them can use detergents suitable for the type of churn they are handling.

### Pipe Lines

General remarks concerning metals and surfaces apply in the case of pipe lines. The usual procedure is brushing and soaking in the detergent solution followed by soaking in a hypochlorite solution, boiling water, or steam. Angle bends require special attention as deposits are often heavier here and corrosion is often found first in these bends.

### Bottles and Returnable Containers of Porcelain or Glass

A large number of machines are available for machine bottle-washing. These consist of three main types:

(*a*) Machines operating wholly on the jetting or hydro principle.
(*b*) Machines operating partly on the jetting principle and partly on the soaking principle.
(*c*) Machines operating wholly on the soaking principle.

A fourth class, which can hardly be described as a machine in the same sense as the previous examples, is the hand operated device which provides agitation in a tank and which is often used in combination with brushing and other manual methods. In these cases it is always advisable to use detergents with a high caustic alkalinity. Temperatures for different machines vary, but the temperature factor, as has already been mentioned, is very important and should be as high as possible. 145° F. is a satisfactory temperature in order to impart to the highly alkaline solution a good degree of killing power against bacteria. Space will not permit a discussion of the relative merits of the soaking and jetting principle, but by far the greater number of machines today are of the latter type.

### Composition of Water Supplies

An important consideration in all kinds of detergency is the nature of the water. In particular it is found that hard waters cause scaling-up of bottle-washing machines with reduced efficiency in all types and the provision of a deposit which will harbour bacteria and prevent them from being destroyed by the alkaline solution. In order to overcome the danger of lime-scale deposit sodium hexametaphosphate has for some time been added to detergents for use in hard water areas. Those machines which incorporate a circulating warm rinse should be carefully watched so that this rinse water does not become contaminated and thus reinfect the clean containers before they go to the final rinse.

Graded and balanced detergents can be obtained for every condition of water and type of machine for use in bottle and container washing. The importance of such qualities as wetting and rinsability cannot be over emphasised where the speed of the bottle through the machine calls for the highest qualities from the detergent. Adequate lubrication for the machine has also to be considered, and this is usually imparted satisfactorily by detergents containing high caustic alkalinity.

### Floors and Walls

Usually mildly alkaline detergents are best and cheapest for floors and walls, and followed by a thorough rinsing with clean cold water will be often satisfactory. Floors, however, are often attacked by acidic food residues, and it is necessary that the solution should penetrate thoroughly into all crevices and porous portions of the floor. Hence, detergents which contain some degree of soap or wetting agent are an additional advantage for this purpose.

Where food fats are concerned floors should be cleaned frequently. Where the floor is concrete the best method is to use a strongly alkaline detergent; wet the floor with hot water, sprinkle the detergent at from 6 to 8 oz. per square yard according to condition, leave for ten to fifteen minutes, and then brush or squeegee the floor. Follow by a water rinse or wash. Walls do not as a rule get or need such frequent cleaning and soaps can be used for this. Where there is some danger of yeast contamination the walls can be sprayed occasionally with a 100 p.p.m. hypochlorite solution.

Tables and benches are best cleaned with mild detergents and wetting agents.

### Ice Cream Plant

In ice cream plant the metals involved will determine the nature of the detergent to be used, but the general instruction for cleaning immediately after use is doubly important. Sterilising may present a difficulty where refrigerated plant is concerned, high temperatures being out of the question. In this case hypochlorites are ideal. Emulsifying or mixing equipment with running bearings should be cleaned with a detergent which has good lubricating qualities.

### Canned Foods

Frequently when canned foods leave the retorts they are in a greasy condition. Machine washing is best, but the detergent must be fairly strongly alkaline to make a good job of the cleaning. The Tin Research Institute has produced a formula which enables such tins to be efficiently cleaned and at the same time protectively filmed so that the tinning will not corrode during the washing process or rust afterwards.

When the material is used in a soaking tank and not in a spraying machine, the addition of a wetting agent is important to speed up the cleaning process. Regular and frequent cleaning of the retorts themselves will aid in preventing excessive carbonisation of the grease on the tins, thus making the cleaning process very much easier.

# The Italian Confectionery Industry

It was only towards the end of last century that attempts were made to industrialise the sweet industry in Italy, and at the beginning of the present century that modern plant appeared and shareholding companies were engaged in production.

Italians as a nation are not addicted to sweets. Statistics show that the consumption of chocolate, for instance, *per capita* during 1933-1934 was smaller even than in Spain with its 0·3 kg., and lagged far behind France (0·9 kg.), Germany (1·3 kg.), Great Britain (2·2 kg.), and U.S.A. (2·4 kg.), to say nothing of Holland with her 6·4 kg. yearly. Apparently, Italians have been brought up to consider sweets a superfluous luxury.

### Development of the Industry

The Italian sweet industry, nevertheless, has been able to reach a considerable degree of development. Curiously enough, wars and their restrictions helped this development. During the 1914-1918 conflict the requirements of the Army gave a marked impetus to the manufacture of chocolate, and the industry entered the year 1940 well equipped with machinery and well run by competent technicians. It was able to adapt itself to war-time conditions, and remained ready for the increased consumption of sweets usual in post-war periods.

Large firms total about twenty, among which are Venchi-Unica, Motta, Perugina, Caffarel, Caffish, Guglielmone, Baratti-Milano, and Ambrosoli. The rest of the industry is represented by small manufacturers, who sometimes act as their own retailers.

The production of sugar confectionery has attained a high state of industrialisation, and is grouped around large northern centres like Turin, Milan, and Genoa, with the exception of Perugia in Central Italy.

Sugar is the stumbling block at the present moment. It has always been a difficult problem, being hedged by high protective tariffs and heavy taxation. Its price has usually been from five to ten times more than in other countries. The sugar industry started in Italy about fifty years ago, and relies on beetroot, the cultivation of which holds ninth place in Italian agriculture.

In pre-war times, out of 62,500 tons of sugar used by Italy, 17,000 tons (27·3 per cent.) were used for sugar confectionery, and 8,100 tons (13 per cent.) for pastry. At present, only 12,260 tons of sugar are assigned to the confectionery industry, which represents only 30 per cent. of its needs. Despite the fact that this quantity of sugar is assigned to the confectionery industry, it is intended

to cut this amount by half, thus making available only 15 per cent. of the sugar it needs.

Supplies of cocoa constitute a difficulty. Its consumption has been growing steadily for many years, and rose from 753 tons in 1870 to over 9,200 tons in 1938. The programme for 1946 envisaged the importation of 11,000 tons of cocoa in beans, and 3,000 tons of cocoa butter.

Before the war, 88 per cent. of Italian confectionery was sold inside the country, but now that it is becoming popular in other countries, modern developments of conservation technique and air transportation will allow the exportation of the daintiest products.

With regard to future prospects, the problem of sugar can partially be solved by a planned policy on the part of the sugar industry, and it is possible to eke out the sugar by the use of sweetening substances such as grape honey and must, which are already giving excellent results.

Undoubtedly it would be necessary to continue importing cocoa and some spices, but this need not be a deterrent. The great success of the chocolate industry in Switzerland, a country which has no cocoa of its own, is an excellent example. Professor A. Lanzillo has observed that in exchanges with foreign countries it is not the quantity of goods imported that matters, but the favourable trade balance. Thus, if an industry demands imports to the extent of 1,000 dollars in order to export to the value of 1,001 dollars, it should not be hampered.

A number of adaptations will be necessary before exportation on a large scale can be organised, but there is every indication that Italian technicians and chemists are alive to all up-to-date possibilities. That this industry is full of vitality has been amply demonstrated by the fact that it survived war-time restrictions and emerged in full efficiency.

As soon as Italian authorities adopt a more benevolent attitude to it, large quantities of Italian sweets should appear in foreign markets.

## German Import Trade

THE relaxations already announced permitting the resumption of private import trade from the British and American Zones of Germany into the United Kingdom from March 4 are to be extended to include the Russian Zone of Germany. In all essential respects, the procedure for United Kingdom buyers is the same as that for the British/American Zones.

For the time being, only essential goods will be imported from Germany, such as machinery and other industrial equipment, chemicals, and certain types of textiles. Payment for goods imported from the Russian Zone will be in sterling. Contracts will be between German sellers and United Kingdom buyers. The approval of the Department of Foreign Trade of the Russian Military Administration of Germany as to the price and terms of payment is necessary before the contract is effective. It is hoped that extended facilities for business men to visit firms in the Russian Zone will be available, and a separate announcement will be made as soon as arrangements have been made with the Russian authorities.

A separate announcement will also be made as to the procedure for United Kingdom exports to the Russian Zone.

The arrangements made with the Russian authorities have been timed to permit United Kingdom visitors to the Leipzig Fair to buy from German manufacturers. As with the United Kingdom and United States Zones of Germany, the absence of normal commercial facilities in telegraphic communication, insurance, handling agencies, free access, etc., will mean that in the initial period of trade, buyers will operate under difficulties. It is hoped that these conditions will be improved as the volume of trade increases.

## A Survey of Scientific Data

AN excellent compendium* representing a collection of papers read to a series of meetings of the Society of Chemical Industry, organised by the Food Group of that Society, contains twenty-seven chapters written by thirty-two experts in various fields of food chemistry, together with an introduction by the late Sir Joseph Barcroft, F.R.S., written in that delightful style which his chairmanship of the Nutrition Society made familiar to many scientists.

The book itself is divided into seven main sections, each of which is devoted to a consideration of various aspects of seven of the major foodstuffs comprising the nation's diet. These are the egg, the potato, vegetables, cereals, meat, fish, and milk. The chapters included in these sections deal with the chemistry, the nutritive value, effects of cooking, and processing of these foods.

The idea of such a book is excellent. The material is presented attractively and lucidly (a credit to the many authors), and there is no other book where such a wealth of valuable material is gathered together in such a readable form. No one concerned in food industry or engaged in nutritional or allied work can afford to be without it.—G. H. B.

* *The Nation's Food*. Edited by A. L. Bacharach, M.A.(Cantab.), F.R.I.C., and T. Rendle, F.R.I.C. London. Pp. 349. 18s. net.

# The German Fruit Juice Industry

A RECENTLY published Report* by Prof. Zoltan I. Kertesz, U.S., covers the subject of high quality fruit juices and fruit juice concentrates which were produced on a large scale in Germany during the war. The germ-proofing filtration method of Seitz and its modification by Böhi is reported to have gained wide acceptance, as also did freeze-concentration by the Linde-Krause method developed and patented early in the war for fruit juice as well as for certain vegetable juices.

The possible influencing of flavour development by the use of enzymes and the use of cold-ray sterilisation of fruit juices by the methods developed for milk, together with a number of special products developed during the war, are discussed.

Some interesting observations were made by the author in connexion with consumer preferences for unfermented apple juice. The German public still seem to prefer a sparkling clear product, and no cloudy or "pulpy" products were observed. This is in sharp contrast to the situation in the United States, where the opinion of the experts and of the public is about evenly divided between clear types of juices on the one hand and the cloudy types on the other.

From what has been observed and what could be learned from the recent German literature, the preparation of the fruit for pressing and the actual pressing operations were performed essentially in the same manner as used in America, although the quality of the equipment, with the exception of a few factories, was not quite up to U.S.A. standards. This is especially true of smaller plants where much antiquated equipment is still in use.

### Mellowing the Flavours

Dr. Kertesz deals with the use of mould enzymes for mellowing the flavours of juices, and records an interview with Dr. Walther of Geisenheim which he considered revealed an interesting idea of potential importance in connexion with the use of clarifying enzymes.

Working in co-operation with Dr. Scheuring of the pharmaceutical firm Boehringer und Sohn in Ingelheim, Dr. Walther tried to effect the mellowing of the flavours of fruit juices and wines by the use of mould enzymes. It is known that during the storage of wines many changes occur, one of them being an apparent "esterification" of the ethanol causing the disappearance of the raw alcoholic flavour and the production of a blend much more pleasant in reaction on the palate. Since some of these reactions, while mostly of unknown nature, are likely to be either the partial oxidation of aldehydes or a transformation of these by the Cannizzaro reaction, any hastening of these processes will speed up the development of a mellow flavour. Such flavour changes seem to be also desirable in some of the unfermented grape juice products which are discussed later. Dr. Walther felt that the use of some of the mould enzymes produced desirable flavour changes in both fruit juices and wines.

### The Boehringer Plant

A visit to the Boehringer plant at Ingelheim disclosed that both Dr. Scheuring and Dr. Boehringer, a former student of Willstätter, believe that such desirable flavour changes by the use of enzyme preparations may not be restricted to fruit juices and wines but may find application in the case of many other foods. It also became apparent from this visit that the driving force behind this line of investigation was the desire to dispose of the approximately 1,000 metric tons per year of fungus micell which was a by-product of the citric acid manufacture at the Boehringer plant. This idea of flavour development by added enzymes, if properly developed, may well become of great importance to the food industries. The present object of these scientists was to produce fruit juice clarifying enzymes which will simultaneously produce the mellowing effect. Some of the tested mould preparations, supplied by laboratories of Boehringer, were claimed to show definite promise in this respect.

### Pectinol and Filtragol

According to officials of the firm Peska-Union at Kreuznach, distributors of both "Pectinol" and "Filtragol" in Germany, the former enzyme had less detrimental effect on the flavour of the clarified juice than did the latter. Yet about four times more "Filtragol" was sold than "Pectinol." This was attributed partly to the fact that several retailers sold "Filtragol" while the other enzyme was marketed by the Peska-Union only, and partly to the not entirely clear patent situation which may well have given the advantage to a product made by I.G. Farben. Apparently little effort was made by Röhm and Haas to increase sales of "Pectinol," which was a product of minor importance in comparison with their other products like

* *Observations on the German Fruit Juice Industry.* J.I.O.A. Final Report No. 50. British Intelligence Objectives Sub-Committee. London. H.M.S.O. 1s. 6d.

proteolytic enzymes and Plexiglass. According to Dr. Walther the clarifying enzymes made by Boehringer were in the research and development stage and were not marketed yet.

**Sterilisation by Filtration**

Professor Kertesz enters fully into the two modifications of the Seitz method, and found that the Seitz-Böhi process was very popular in Germany although little known in the United States. He tasted many juice samples preserved by this method at several German factories. He found that most German fruit products research stations were equipped for the use of the Seitz-Böhi process, and that many of the apple juice as well as the grape juice samples exhibited exceedingly fine flavour and "bouquet." In fact, some of the white grape juice samples prepared in this manner at Geisenheim had flavours reminiscent of fine vintage wines, while some of the unfermented apple juice samples, after long storage, showed aromas definitely superior to those in apple juice commercially produced in America.

The main difference between our way of thinking, he says, and the views of German fruit juice technologists is in the opinion that according to them storage of a fruit juice enhances its flavour quality, while we seem to assume that the quality of a fruit juice runs the same undesirable downward course as in most other prepared food products. An observation of the products seems to justify the German opinion. However, it is stressed by German technologists that the fruit juice must be filtered clear for this desirable development or mellowing of the flavour, and that in cloudy or insufficiently clarified juices bitter side flavours will occur during storage.

**Ultra-Violet Sterilisation**

The machines for sterilisation of milk and fruit juices were constructed by the Quarzlampengesellschaft Hanau shortly before the war. The steriliser has been extensively tested at Geisenheim, but the results are not satisfactory. By passing fruit juices through this machine with anything approaching commercial capacity, only 83 per cent. destruction of yeasts and 72 per cent. destruction of moulds was obtained.

Towards the end of the war improved machines, based on this principle, have been developed for the sterilisation of milk at the Dairy Research Institute at Kiel. These employed coils with total lengths of about 110 metres and with an inside diameter of less than 1 cm. The coils transporting the milk pass between many tube-shaped quartz lamps which affected the sterilisation. The temperature of the milk was about 15° C., and was not essentially raised when passing through the machine. The work on the machine has been interrupted by the end of the war. This subject has been investigated and reported by Dr. C. O. Ball of T.I.I.C.

It is evident that so far as fruit juices are concerned the work already effected in Germany is commercially inconclusive.

**Concentrated Fruit Juices**

Dr. Kertesz describes the two main methods of concentrating unfermented fruit juices which were used in Germany during recent years. The first one was by vacuum concentrators essentially of the well-known types that have been used for some time, the other was concentration by freezing. Both these methods had been published before the war.

**Miscellaneous Fruit Juices**

At the end of the Report, Professor Kertesz makes some general remarks about fruit juice products in Germany during World War II.

He specially notes the high quality of grape juice which may be obtained from white Vinifera type grapes. Under proper methods of manufacture such products may possess all the good flavour and aroma ("bouquet") of good white wines, and indeed, those not experienced in judging wines would have difficulty in determining whether the product is a sweet beverage or a wine. It would appear that such products would have a good market in the United States where so many have scruples in enjoying alcoholic beverages.

The Hummel plant produced during the last years of the war over 100,000 lb. of a rose-hip syrup per year. This was a vacuum-concentrated extract from rose hips often imported from as far as Bulgaria. The final syrup had a pleasant acid flavour, a S.G. of 2·4 (15° C.), and a *p*H of 3·8. According to German information it contained about 200 mg. per cent. ascorbic acid, but one sample analysed in London during the summer of 1945 contained 109 mg. per cent. and another only 86 mg. per cent. ascorbic acid. These amounts found may represent the disappearance of ascorbic acid during storage. The total production was said to have gone to the German Navy. A two-stage stainless steel vacuum concentrator was used for this product. This concentrate was preserved by pasteurisation at 75° C. to 80° C. for one minute.

The same plant also made a great deal of rhubarb juice by the Seitz-Böhi method and some 1:4 rhubarb concentrates. Of the latter product 1,760,000 lb. were made in 1944. A mixed rhubarb-apple juice (2:3) manufactured at this plant is said to have been very successful.

Beneath the snow-capped peaks of the Sierra Madre range in Riverside County, California, oranges are gathered from heavily laden trees protected by palms that serve as a windbreak.

# CALIFORNIA'S CITRUS INDUSTRY

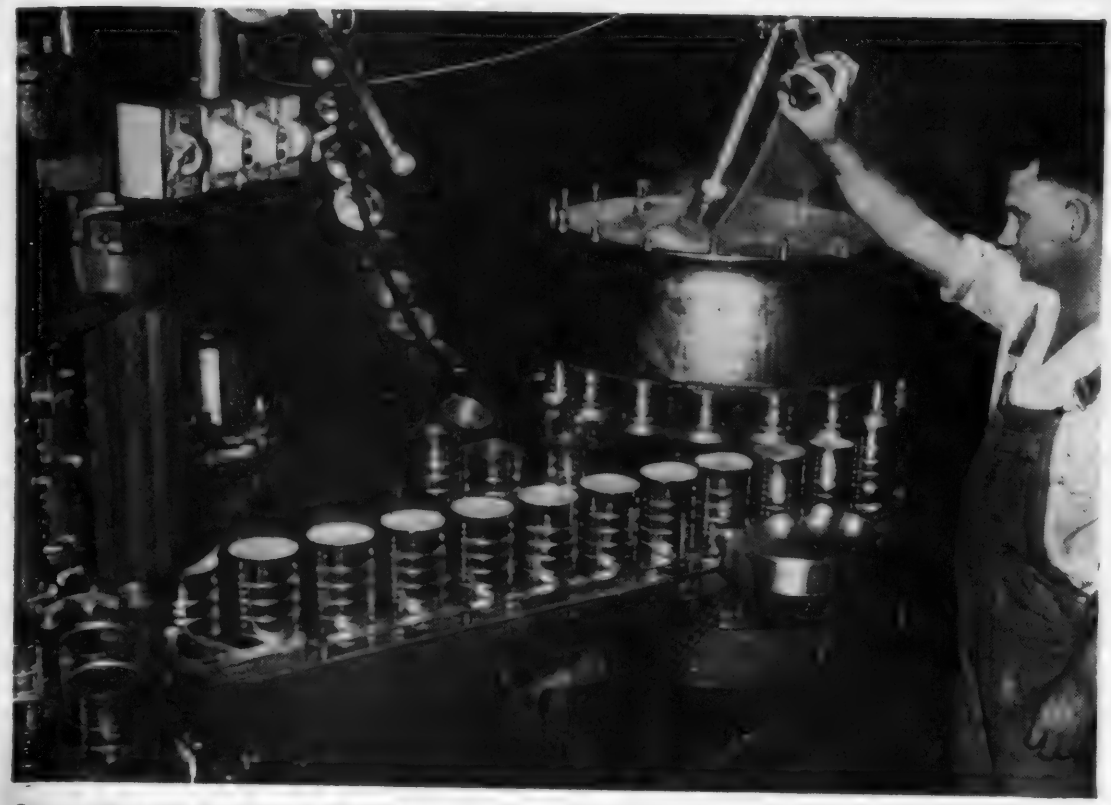
Left: California produced 13,321,000 boxes of lemons in 1944. Here some are being picked in Los Angeles County.
Right: Irrigation plays a big role in citrus production.

The fruit passes on an endless conveyor, where fruit not up to standard is removed.

As the oranges go through the packing plant they are counted by the giant tabulator in the foreground.

Close-up of oranges coming through the tabulator.

As the oranges pass through the "squeezer" they are cut in half, held in the cups, and the juice squeezed out by the revolution of the cup-covered wheel



**Cans are filled with citrus juice and sealed at the processing plant.**

**Orange juice bar in Southern Florida.**

*July*, 1947

# PROFILE

# Vernon L. S. Charley

EVEN in his youth there was never any doubt about Vernon L. S. Charley, B.Sc., Ph.D., becoming "something in the chemical line." In the little village of Blakeney, when a boy, he remembers the stiff and starchy lady in charge of the local chemist's shop saying there was a fortune for anyone who could make better corn pads. Following up this line of thought led him to a neighbouring town where the pharmacist gave him simple chemical literature to read and this axiom to digest: "Whatever you do, make something good and see that somebody is the better for your having lived."

**From School . . .**

During his schooldays in Gloucester he suffered from following an extremely brilliant brother—a nightmare for a schoolboy. The usual tale was "Here's Charley again; ten questions set, seven attempted, four wrong. Now, if this had been Charley's brother, he would have done ten and got them right, and asked me to check three or four that he had done extra." At this stage he was much more interested in school sports, and while captain of the school football 1st XI achieved the unique distinction of gaining more points for his school house in the annual sports than were gained by the whole of the competitors from a competing house. Life seemed all hard work these years. Organ practice at home 6.30 a.m. to 7.0 a.m. (his mother blowing the organ); breakfast 7.15 a.m.; four miles cycle ride and twenty miles train journey every day, arriving back home at 6.0 p.m.

**. . . to University**

And so to Bristol University, 1923-1927. Coming from the country with thick homespun tweeds, he felt a marked inferiority complex and showed it, especially to the fair sex. At the commencement of the second term, Professor Francis had to open his main laboratory to women, and as there was not room for everyone and having noted Charley's timorous nature, he was asked whether he would like to share the Professor's own private laboratory with him. This marked the turning point, and the next three years were among the happiest he had spent. At this time the acme of ambition was to leave the University for a £300 a year industrial job, and practically all the students of his year (except the teachers) did this. At the Professor's suggestion, he took a job at £150 a year in the Agricultural Department of the University, and scrubbed sugar beet and sliced them—and himself—in the interests of agricultural science, working in a dingy little kitchen underneath the Advisory Offices.

At the University Charley achieved the distinction of being the youngest student to take the degree with First Class Honours, and at the same time became the Institute of Chemistry Prizeman for the year.

Sporting activities included, almost to the exclusion of all others, rowing in the University Boat Club. Memories of those days bring back the feeling of respect for the linguistic capacity of some Church of England clergymen whose adverse criticisms of Charley's rowing he thought could surely only be surpassed in Billingsgate.

After one year in the Agricultural Office Charley was appointed to the biochemical position under the Empire Marketing Board research scheme at the Long Ashton Research Station, which continued for three years. And then came the appointment to the job which provided him with his life's work. The Ministry of Agriculture, at the request of the National Farmers' Union, initiated the comprehensive investigation into the utilisation of surplus fruits, and he was appointed to undertake this work at Long Ashton under Professor Barker and Dr. (now Professor) T. Wallace. The Products work included responsibility for the National Cider Institute, and then began sixteen years of the hardest tasks anyone could be fortunate enough to undertake.

**The Apple Juice Industry**

He saw the apple juice industry founded as a result of the Long Ashton work; he saw pure fruit syrups in large scale production based entirely on his own work, and was sent by the Ministry to plan and supervise production in these factories; apple juice was studied on three separate occasions in Germany, working in a factory for a wage because the previous "Cook's Conducted Tours" in

his best suit had failed to give him a grasp of the principles involved. Every other year he organised and conducted a tour of scientific studies in some European country, including France, Holland, Germany, and Switzerland, for members of the Cider Makers' Association.

Then came the war. After helping to dispose of part of the surplus apple crop, Professor Drummond (now Sir Jack) approached Charley to help the Ministry to provide blackcurrant syrup for babies. This provided him with one of the greatest thrills of his life, and it is with keen pleasure that he looks back on the fact that there were between two and three hundred thousand "blackcurrant babies" who owe some of their activity and delight to blackcurrant syrup, a product of Long Ashton research.

In the middle of the war the carrot crop got out of hand, and for five hectic weeks Charley organised production of carrot treacle, another Long Ashton product, in milk condensers and cider factories in Somerset and Devon.

Then followed the decision of the Ministry of Health to process rose hips, and the Long Ashton Station had three weeks in which to provide their views on the most suitable process. The average academic outlook was useless. Hips were put through Mrs. Charley's mangle, through rubber squeejee rollers in the local baths, and finally the ideal process was achieved by rolling the hips under a garden roller, getting the correct pressure by perching the director's secretary on top of the roller. This process again was carried through to commercial completion in a local factory.

**Commercial Appointment**

In 1943 came the break. Utterly exasperated by the vacillations of Government Departments as to who should continue Fruit Products Work, it was with the deepest possible regret that he left Long Ashton to accept a commercial appointment with Messrs. H. W. Carter and Co., the Bristol firm who had taken up and pioneered his work on fruit syrups, including blackcurrant and rose hip. Progress under the new arrangements in a beneficent atmosphere of directors who were sympathetic and helpful was now rapid. Decisions that took twelve months to obtain from Government Departments could now be given in a matter of fifteen minutes. His aim was to provide the greatest possible supplies of pure fruit juices and syrups for the general public, and to exploit the health value of these products for hospital and welfare work. Through the instrumentality of the Viceroy the firm were asked to undertake the review of the state of nutrition in India as it affected the utilisation of Indian fruits and vegetables for the production of vitamin products for internal consumption. This work is now rapidly coming to a climax.

His close contact over twenty years with the University staff enabled Charley to carry out many tests on fruit juices in the hospitals of Bristol, and an enormous amount of work has been done on the use of fruit products for light diets for ulcer patients, as well as the preparation of apple juice for the treatment of pink disease, scattered cases of which have occurred all over the country.

And now full circle. The firm are equipping a very large modern fruit juice factory at Coleford in the Forest of Dean, very near the little pharmacist's shop where Charley got his first ideas on chemistry, and in twelve months' time the wanderer will have returned home. Charley was asked by the directors to lay the foundation stone, the inscription being: "At the invitation of his colleagues, this stone was laid August, 1946, by Vernon L. S. Charley, Esq., B.Sc., Ph.D.; born in the Forest of Dean, he inspired the planning of this factory."

**Teetotal Pubs**

One outside point of a social nature concerns him greatly. He is a keen supporter, not only of the widespread dissemination of pure fruit juices, but of the provision of attractive places in which they can be sold—in other words teetotal pubs. Taking a tremendous interest in young people, the lack of provision for their relaxation appals him. Having no wish to deprive any beer drinker of a drop of his favourite liquor, he feels strongly that those who do not like alcoholic beverages could be better catered for than they are at the moment. For this reason, Charley and others are endeavouring to make provision for alternatives to the public house.

A member of the Food Group of the Society of Chemical Industry, he has served for two periods on its Committee. He is also a member of the Chemical Society, Biochemical Society, Nutrition Society, and Society of Dairy Technology (for much of his work is associated with the incorporation of fruit products into dairy materials). For two years he was chairman of the Bristol and South-Western Section of the British Association of Chemists. He received his Ph.D. in 1943 for a dissertation on nine years' research work on fruit products.

Despite all these activities, Sundays are kept absolutely free for Church work, except of course when a batch of blackcurrant or other soft fruit kicks over the traces and needs attention. Physical activities have now unfortunately been ruled almost completely out. All that can be found time for is the weekly rush to be first out of the station from the London train, and ambling about on the awkward back of the children's black mare, which, according to critics, is a sight for the gods.

## German Ham Canning Industry

THE object of a recent visit to German ham canning factories was to investigate the curing and canning process in view of the fact that the opinion had been expressed that "the Germans were extremely clever at canning hams, and their packs were much superior to both American and British packs."

Results of the investigations have been published in a report,* and although details could not be checked by interrogation of personnel, a number of interesting facts are presented.

Pigs legs are chilled and then cured by artery injection of the pickle followed by immersion in a brine. The formulae of the brines and the amount of liquid injected varied considerably in different factories. The Beisser method of artery curing was patented by Georg Beisser of Hamburg, and ham canners all over the world have used this process with success.

The curing and draining cellar temperatures followed normal practice. Draining times varied considerably from two to fourteen days, and hot smoking was usually practised overnight by beech wood in small smoke rooms. From information available, it appeared that power pressing of the boned-out legs was not generally employed.

Cooking times and temperatures again varied in different factories. These were said to leave the hams in a non-sterile and relatively perishable condition which usually necessitated storage under refrigeration. During the war, in canned hams for export to hot climates, *e.g.* North Africa, the addition of sodium benzoate as a preservative was permitted.

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## Mass Feeding

DIVIDED into thirty-four chapters is a book† treating of nutrition, menu planning, the purchasing and methods of cooking foodstuffs, and the preparation of dishes for various servings from 5 to 100. From a purely culinary point of view this book is first class, and it lives up quite adequately to its title.

However, the attempt to introduce the subject of nutrition into the book has marred it to some extent, being dealt with in a single chapter of less than 5,000 words. It can thus contribute very little of value and anyone reading it would gain very little knowledge of the subject. Far better for them to purchase a companion book on nutrition and read the subject properly.

There is a conspicuous lack of attempt to apply any nutritional knowledge in a practical way. There are many excellent recipes, but no indication is given of the nutritive value of the final result. It is all very well to know, as we have in the past, that some ingredients contain certain vitamins and minerals, but we want to know what happens to them in the cooking. The author makes no reference to the valuable work done in this country during the war, and subsequently published in various journals, concerning the vitamin losses of vegetables during the processes of cooking, keeping hot, shredding, and so on; subjects which one would have thought of very great importance in a book such as this. However, if what is wanted is a book which describes lucidly how to cook tasty meals for a lot of people, this is one to buy.—G. H. B.

**The picture of the new Redifon radio heat plastic welder was printed upside down in the June issue, and is here reproduced correctly**

* *B.I.O.S. Report No.* 299, *Item No.* 22. H.M.S.O. Pp. 23. 2s. 6d. net.

† *Group Feeding.* By C. A. Kaiser. London. Pp. 490. 25s. net.

# Ministry of Food

## Latest Statutory Rules and Orders

The list given below is the continuation of the list of Orders published in *Food Manufacture*, June 1, 1947, page 256.

| No. | Date. 1947. | PRICE FIXATION ORDERS |
|---|---|---|
| 217 | Feb. 7. | Milk Powder (Maximum Prices) Order, 1947. Revokes S.R. and O. 1941, No. 1853; 1942, No. 2060; 1945, No. 196. |
| 231 | „ 10. | Order amending the Flour Confectionery (Control and Maximum Prices) Order, 1946. |
| 327 | „ 22. | Order amending the Egg Products (Control and Maximum Prices) Order, 1946. Revokes S.R. and O. 1946, No. 2214. |
| 330 | „ 24. | Order amending the Poultry (Control and Maximum Prices) Order, 1946. |
| 378 | Mar. 1. | Order amending the Cereal Breakfast Foods (Control and Maximum Prices) Order, 1945. Revokes S.R. & O. 1946, No. 847. |
| 428 | „ 11. | Order amending the Cheese (Control and Maximum Prices) Order, 1946. |
| 442 | „ 12. | Order amending the Sugar (Control and Maximum Prices) Order, 1943. |
| 525 | „ 25. | Order amending the Eggs (Control and Prices) (Great Britain) Order, 1946. |
| 534 | „ 26. | Order amending the Cereal Breakfast Foods (Control and Maximum Prices) Order, 1945. |
| 535 | „ 26. | Eggs (Control and Prices) (Northern Ireland) Order, 1947. Revokes S.R. & O. 1944, No. 247 and 1946, No. 2040. |
| 536 | „ 26. | Order amending the Oat Products (Control and Maximum Prices) Order, 1945. |
| 545 | „ 28. | Order amending the Meat Products and Canned Meat (Control and Maximum Prices) Order, 1947. |
| 546 | „ 28. | Order amending the Macaroni and Similar Products (Control and Maximum Prices) Order, 1942. |
| 551 | „ 28. | Butter (Control and Maximum Prices) Order, 1947. Revokes S.R. & O. 1943, No. 1765, and 1946, No. 654. |
| 552 | „ 28. | Order amending the Raw Cocoa (Control and Maximum Prices) Order, 1946. |
| 553 | „ 28. | Order amending the Rice (Control and Maximum Prices) Order, 1943. |
| 557 | „ 28. | Order amending the Animal Fats (Control and Maximum Prices) Order, 1946. |

| No. | Date. 1947. | PRESERVES |
|---|---|---|
| 558 | Mar. 28. | Order amending the Lard (Control and Maximum Prices) Order, 1943. |
| 596 | „ 31. | Order amending the Canned Puddings (Maximum Prices) Order, 1945. |
| 597 | „ 31. | Order amending the Coffee (Maximum Retail Prices) Order, 1946. |
| 598 | „ 31. | Poultry (Control and Maximum Prices) (Northern Ireland) Order, 1947. Revokes S.R. & O. 1946, Nos. 1459 and 1656. |
| 638 | Apr. 10. | Order amending the Feeding Stuffs (Maximum Prices) Order, 1946. |
| 715 | „ 21. | Order amending the Condensed Milk (Control and Maximum Prices) Order, 1943. |
| 724 | „ 22. | Order amending the Syrup and Treacle (Maximum Prices) Order, 1941. |
| 742 | „ 23. | Order amending the Invert Sugar (Maximum Wholesale Prices) Order, 1943. |
| 759 | „ 25. | Order amending the Sugar (Control and Maximum Prices) Order, 1943. |
| 776 | „ 25. | Order revoking the Shell Fish (Maximum Prices) Order, 1944. |
| 858 | May 7. | Order amending the Bacon (Control and Prices) Order, 1944. |
| 859 | „ 7. | Order amending the Chocolate, Sugar Confectionery and Cocoa Products (Control and Maximum Prices) Order, 1944. |
| 860 | „ 7. | Order amending the Soya Flour (Control and Maximum Prices) Order, 1946. |
| 892 | „ 12 | Tea (Prices) Order, 1947. Revokes S.R. & O. 1946, No. 1460. |
| 928 | „ 14. | Order amending the Canned Puddings (Maximum Prices) Order, 1945. |

| | | CEREALS |
|---|---|---|
| 926 | May 14. | Order revoking the Cereals and Cereal Products (Licensing and Control) (Dealings Abroad) Order, 1944. |

| | | EDIBLE OILS |
|---|---|---|
| 701 | Apr. 19. | Order amending the Edible Oils and Fats (Control of Sales) Order, 1944. Revokes S.R. & O. 1946, No. 386. |

| No. | Date. 1947. | FEEDING STUFFS |
|---|---|---|
| 716 | Apr. 21. | Order amending the Feeding Stuffs (Licensing and Control) Order, 1943. |
| | | **FISH** |
| 741 | Apr. 23. | Order amending the White Fish (Distribution) Order, 1945. |
| | | **FLOUR** |
| 548 | Mar. 28. | Flour Order, 1947. Revokes S.R. & O. 1945, Nos. 1, 1149, 1347; 1946, No. 249, 545, 1155, 1536. |
| | | **FRUIT** |
| 11 | Jan. 2. | Order amending the Citrus Fruit Order, 1945. |
| 15 | ,, 3. | Order revoking the Dried Fruits (Control) Order, 1939. Revokes S.R. and O. 1939, Nos. 1106 and 1478. |
| 27 | ,, 4. | Order revoking the Home Grown Fruit Order, 1946, and the Imported Soft Fruit Order, 1946. Revokes S.R. and O. 1946, Nos. 679, 694, 839, and 1325. |
| 37 | ,, 8. | Order amending the Bananas Order, 1945. |
| 188 | Feb. 4. | Order revoking the Cherries Order, 1945, and the Imported Cherries Order, 1946. Revokes S.R. and O. 1945, No. 417; 1946, No. 472. |
| 333 | ,, 24. | Order amending the Canned Fruit and Vegetables (No. 2) Order, 1946 |
| 739 | Apr. 23. | Order amending the Imported Apples Order, 1946. |
| 740 | ,, 23. | Order amending the Bananas Order, 1945. |
| 822 | May 2. | Tomatoes Order, 1947. Revokes S.R. & O. 1946, Nos. 517, 1411, 1513, 1735. |
| | | **GELATINE** |
| 968 | May 16. | Order amending the Edible Gelatine (Control) Order, 1947. |
| | | **ICE CREAM** |
| 612 | Apr. 2. | Ice Cream (Heat Treatment, etc.) Regulations, 1947. |
| | | **LABELLING** |
| 757 | Apr. 25. | Order amending the Labelling of Food Order, 1946. |
| | | **LICENSES** |
| 738 | Apr. 23. | Order amending the Food (Licensing of Retailers) Order, 1945. (Permits traders to sell by retail wet, cured or dried fish without holding a licence under that Order.) |

| No. | Date. 1947. | MEAT |
|---|---|---|
| 544 | Mar. 28. | Order amending the Meat (Rationing) Order, 1946. |
| | | **MILK** |
| 722 | Apr. 22. | Milk (Non-Priority Allowance) (No. 1) Order, 1947. Revokes S.R. & O. 1946, No. 2150. |
| | | **MUSTARD** |
| 650 | Apr. 11. | Order amending the Food Standards (Mustard) (No. 2) Order, 1944. |
| | | **PICKLES AND SAUCES.** |
| 876 | May 9. | Pickles and Sauces Order, 1947. Revokes S.R. & O. 1946, No. 2216. |
| | | **POINTS RATIONING** |
| 537 | Mar. 26. | Order amending the Rationing (Personal Points) Order, 1946. |
| 550 | ,, 27. | Order amending the Food (Points Rationing) Order, 1946. |
| | | **POTATOES** |
| 420 | Mar. 10. | Order amending the Potatoes (1946 Crop) (No. 2) Order, 1946. |
| 502 | ,, 22. | Order amending the Potatoes (General Provisions) Order, 1944. |
| 503 | ,, 22. | Order amending the Potatoes (1946 Crop) (No. 2) Order. |
| 639 | Apr. 10. | New Potatoes (1947 Crop) (No. 18) Order, 1947. |
| 702 | ,, 19. | Order amending the Potatoes (1946 Crop) (No. 2) Order, 1946. |
| 723 | ,, 22. | Order amending the Potatoes (1946 Crop) (No. 2) Order, 1946. |
| | | **PRESERVES** |
| 755 | Apr. 24. | Order amending the Preserves Order, 1944. Revokes S.R. & O. 1946, No. 2217. |
| 878 | May 9. | Order amending the Preserves Order, 1944. |
| | | **RATIONING** |
| 345 | Feb. 27. | Food Rationing (General Licence No. 3) Order, 1947. |
| 556 | Mar. 28. | Food Rationing (General Licence No. 4) Order, 1947. |
| 714 | Apr. 21. | Food Rationing (General Licence No. 5) Order, 1947. |
| | | **SOFT DRINKS** |
| 478 | Mar. 18. | Order amending the Soft Drinks Order, 1946. |
| | | **VEGETABLES** |
| 333 | Feb. 24. | Order amending the Canned Fruit and Vegetables (No. 2) Order, 1946. |

# The Use of Scientific Instruments in Chemical Analysis

J. H. GLOVER, B.Sc., A.R.I.C.

**Part II**

In the first article of this series, the application of Beer's Law to visual colorimetry was discussed. It was shown that the concentration of a coloured substance in solution is inversely proportional to the intensity of the light transmitted by that solution, and methods were outlined for the determination of this intensity. These methods were confined to the visual estimation of brightness, and such procedures are subject to personal error due to the limitations of the eye, and its inability to detect small changes in light intensity. The use of photo-electric effects in the measurement of light overcomes these disadvantages to a very large extent, since sensitive galvanometers are employed which are capable of a high degree of accuracy.

LIGHT energy is able to produce three distinct electrical effects, which may be outlined as follows:

1. A metal surface, in a vacuum, and subjected to an applied voltage, will produce an electric current if light is incident upon it.
2. An alteration in the electrical resistance of certain substances occurs when they are illuminated.
3. Light can be made to generate a current without any applied voltage if incident upon certain systems known as photo-voltaic cells.

The first effect is employed in the Phototube, which is a very accurate device, but the current generated is very small and a sensitive galvanometer is needed, rather too delicate for general use. Alternatively the current may be amplified, but this renders the apparatus more complex and expensive; and hence it is used only for very precise work, and for the measurement of low intensities.

The second effect is unsuitable for use in colorimeters as the alteration in resistance is not directly proportional to the incident light, and the effect is not always easily reproduced.

The photo-voltaic cell is usually employed in colorimeters, and the phenomenon involved is known as the Becquerel effect. The cell is made up of three layers, an outer layer of metal, which is sufficiently thin to be transparent; a middle layer, consisting of selenium or copper oxide; and a metal base. The middle layer of selenium is known as the "semi-conductor." In the dark, this has a "one way" effect, electrons being able to pass from the adjacent metal to it, but not in the opposite direction. On illumination, electrons are freed from the middle layer and flow to one of the outer metal layers, thus generating an electric current. Terminals are attached to the outer metal layers, and the whole system is contained in a waterproof case fitted with a window to permit the entry of light.

These photo-voltaic, or "barrier", cells generate a fairly high voltage (roughly about 0·1 volt), for an illumination of moderate intensity, say that produced by a 30 watt bulb. Hence, amplification of the current produced is not necessary for its accurate measurement, a rugged pointer type of galvanometer being usually quite satisfactory. Provided that the resistance of the external circuit is fairly low, then the current generated by the cell is directly proportional to the intensity of the light incident upon it. Thus the photo-voltaic cell affords an accurate means of measuring light intensities.

It was seen in Part I of this series that Beer's Law may be expressed in the form:

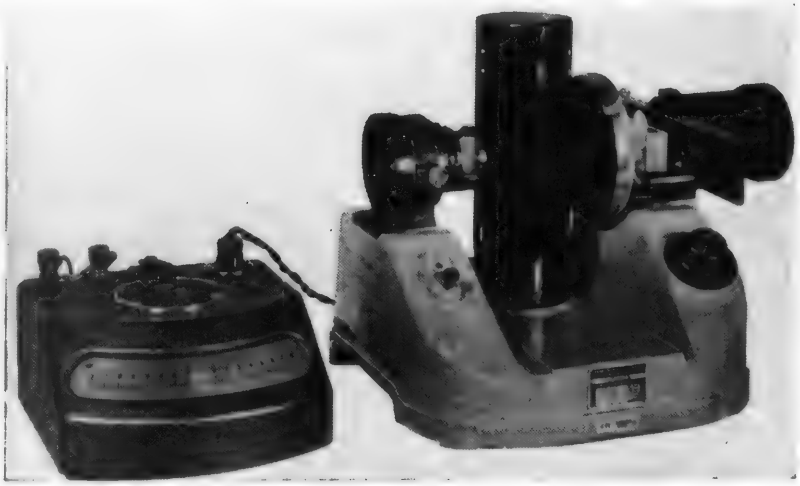
$$c = \frac{1}{ad} \log_e \frac{I_o}{I} \quad . \quad . \quad . \quad (1)$$

Where a is the extinction coefficient,
and c and d are the concentration and thickness of the solution.
$I_o$ is the intensity of the incident light,
and I that of the emergent light.

The equation may be further simplified as follows:

$$c = \frac{I}{K} D \quad . \quad . \quad . \quad . \quad (2)$$

Where D is the optical density and K is a constant.



**The Spekker photo-electric absorptiometer with separate galvanometer.**
*Courtesy Adam Hilger, Ltd.*

The current produced by a photo-voltaic cell is directly proportional to the intensity of the incident light, hence we may write:

$$c = \frac{I}{K (\log i)} \quad . \quad . \quad . \quad . \quad (3)$$

Where i is the current produced by the photo-cell.

Thus it will be seen that a linear relation should theoretically hold between concentration and the logarithm of the current produced.

### The Use of Photo-Voltaic Cells

There are certain points to be noted in the use of photo-voltaic cells. The first is a phenomenon known as "fatigue"; as the term implies, this comprises a diminution in the photo-electric effect with continuous exposure to light. This is a complex property and is in some way dependent upon the nature of the surfaces of the cell, the intensity of the illumination, and the internal resistance of the cell. Hence it is advisable to keep photo-cells in the dark when not in use, to use as low working intensities as possible, and not to measure a beam of low intensity immediately after a much higher one. Fatigue is a temporary effect, the cell recovering completely after a period of rest.

A second point is the variation of the sensitivity of the photo-cell with wavelength. The response of the cell falls off appreciably towards the red portion of the spectrum. Sensitivity is usually quite high to ultra violet light, but cells with quartz windows must be used.

Many types of apparatus are in use which incorporate the photo-voltaic cell. Of these, the simplest is the direct reading photometer, in which a beam of light is transmitted by the solution under test, and the emergent beam is received on a photo-cell. The current generated is measured on a suitable galvanometer. A calibration curve is prepared with a series of standards, by plotting galvanometer deflections against concentration.

A great disadvantage of the direct reading instrument is the source of error due to variations in the lamp. To obviate these discrepancies the lamp should be supplied with power from accumulators, or by means of a constant voltage transformer.

An instrument of this type has been described for the determination of Vitamin A in margarine.[1] In this case the light source is a 6 watt automobile lamp which is run from an accumulator, constancy of voltage being maintained by a rheostat. The galvanometer is calibrated with two scales, one reading linearly in per cent. transmission, and the other logarithmically to give optical density.

### Photo-Electric Absorptiometer

It has been pointed out that the photo-voltaic cell functions with increased stability and greater linearity of response when there is no current flowing. To achieve this state, the photo-current is balanced by an applied current flowing in the opposite direction until the galvanometer has a zero reading. The photo-electric effect is then equal to the voltage necessary to produce the equalising current. A convenient method of applying this technique is by using a potentiometer and a standard cell.

The principle of balancing the photo-current to zero is embodied in a very useful instrument known as the Spekker photo-electric absorptiometer. Since this instrument has such a wide field of use it will be described in some detail.

The Spekker differs from the other instruments described in that it employs two photo-cells, both

illuminated by the same light source. For convenience the two photo-cells may be distinguished as the reference cell and the indicating cell.

The optical system is as follows: Between the reference cell and the lamp an iris diaphragm is fitted, and a calibrated variable aperture is fixed between the indicating cell and the lamp. The variable aperture takes the form of a rectangular metal shutter, the area of the aperture being varied by the movement of a drum. The drum is calibrated logarithmically from zero, when fully open, to infinity, when completely closed: so that it may be seen from equation 2 that the drum reading is directly proportional to the optical density of the light passing through the aperture.

On the reference side of the system a mount for a solution cell is fixed between the lamp and the iris diaphragm, and on the indicating side the solution cell holder is fixed between the calibrated aperture and the photo-cell. The light is focused to a suitable beam by a lens system and holders for filters are placed either side of the lamp.

The two photo-cells are connected in opposition to a galvanometer so that when each cell is equally illuminated the recorded current is zero. The method of using the instrument may be simply outlined as follows: With water in the optical cell on the reference side, and the solution to be determined in the cell on the indicating side, the drum is set to zero and the iris adjusted until the current is zero. The solution is then replaced by water and the drum operated until the current is again zero, the drum reading is then a measure of the optical density of the solution. The Spekker is nearly always operated with water in the cell in the reference side, this cell being generally known as the "water cell."

**Working Details**

The design of this instrument is such as to include most of the desirable features of one cell types, and to remove many of their disadvantages. Inconstancies in the light source due to changes of voltage, ageing of the lamp, or any other reason, are automatically compensated, since both reference and indicating cells are equally subject to them. The photo-voltaic cells are working under the desirable state of having no potential difference across their terminals, and if suitable filters are used the relation between drum reading and concentration is nearly always a linear one. A very sensitive galvanometer may be used to find the zero point, since, if it is suitably shunted with a variable resistance, there is no danger of large off-scale deflections.

Owing to the logarithmic calibration of the drum the optimum accuracy of readings is between drum readings 0 and 1·0, hence it is desirable to restrict the range between these limits. This may be done by a setting technique adopted by Vaughan.[2] Water is placed in both the sample and the "water cell" and the drum set to read 1·0, the iris is then operated to give zero current on the galvanometer.

The water in the indicating side is then replaced by the solution to be determined and the drum operated until a balance is again obtained, the difference in drum readings being then a measure of the optical density. A series of determinations may be made in this way without any alteration in the setting, and any solution having a light absorption sufficiently large to give a drum reading greater than 1 is automatically excluded since a reading will not be obtained. This technique is known as the water to water 1 setting.

A calibration curve is always employed in determinations involving the Spekker, and it is important that the standard solutions used in preparing such a curve should be made up exactly to simulate the conditions under which subsequent samples will be measured. The total salt concentration of a solution has a marked effect upon light absorption apart from that due to the coloured constituent.

**Use of Solvents**

Solvents other than water when used in the absorptiometer also have an absorption effect for which allowance must be made. An example occurs in the determination of traces of lead with dithizone reagent. Aqueous solutions containing the lead are shaken with a solution of the reagent in toluene, the lead combines with the dithizone to give a pink complex which is soluble in the toluene, and may thus be separated. After removal of excess reagent, the colour of the toluene solution is then a measure of the lead present. In estimations of lead with the Spekker by this method two blanks must be prepared, a "reagent blank" to compensate for any trace of lead present in the reagents, and a "solution blank" to compensate for the absorption characteristics of the toluene.

This method for lead and colorimetric methods for the determination of traces of other metals with the Spekker is described in an excellent paper by Strafford and co-workers.[3]

The selection of a suitable light filter for a particular determination is an important factor. It has already been shown that the extinction coefficient, a factor affecting Beer's Law, varies with the wavelength of the light used; and hence the ideal filter should transmit light only of the wavelength absorbed by the solution under test. The best method of selecting the correct filter is to determine the wavelength of the absorbed light by means of a spectrograph and then to prepare a

(*Concluded on page* 318)

# Agricultural Education

THE Summer Meeting of the Agriculture Group, jointly with the Bristol sections of the Society of Chemical Industry and the Royal Institute of Chemistry, took the form of a visit to Seale-Hayne Agricultural College at Newton Abbot, South Devon, on May 17.

A meeting of the committee of the Group opened the proceedings, during which officers for the coming session were elected. This was followed by the Annual General Meeting.

Members were then conducted to the town where an excellent luncheon was provided by the College. In welcoming the guests, Professor A. W. Ling, Principal of the College, briefly touched upon its foundation. Originally intended for the training of sixty students, the growth of the College is such that this number has been trebled since its inception. Professor Ling looked forward to the time when, following the obtainment of a charter by the University College of the South-West, Seale-Hayne Agricultural College would be the Faculty of Agriculture. Dr. M. A. H. Tincker, chairman of the Group, responding, expressed thanks on behalf of the members of the Group for the kind hospitality accorded them, after which the party returned to the College and commenced the round of visits to the different departments, ably conducted by Mr. A. W. Marsden.

### The Laboratories

The chemistry, dairy bacteriological, veterinary bacteriological, and agricultural biology laboratories were among those visited. Mr. Marsden gave a sketch of the instruction given in chemistry. The type of training provided in the dairy bacteriological laboratory was outlined by Miss H. R. Chapman, who had prepared some specimens of slides and cultures for inspection. The course in general and specialised bacteriology for students of veterinary science was the subject of a talk by Mr. MacPherson, who also described some research work that was carried out, including studies in mastitis and the effects of penicillin on different strains of micro-organisms. A similar description of the training in agricultural biology was given by Mr. K. C. Vear.

### Agriculture, Horticulture and Poultry Husbandry

From the laboratories, Miss Chapman conducted the visitors through the model dairy in which instruction is given on cream production, butter and cheese making. Typical examples of soft and hard cheeses made in this department were exhibited.

Mr. G. F. Kingston, of the agricultural department, accompanied members to the modern piggeries, where pedigree breeding herds of large White and Wessex saddle-back pigs are maintained. The dairy herd, consisting of pedigree and grading-up South Devons, was next inspected, and Mr. Kingston, in an interesting talk, mentioned that the herd, bulls, and young stock have all passed the tuberculin test, and that the College holds a T.T. milk producer's licence from the County Council. In addition, the whole of the dairy stock are blood agglutination tested for abortion and are vaccinated against this disease.

Equipped to provide students taking a course in Agriculture, Horticulture, and Poultry Husbandry with instruction in workshop practices relating to these industries, the College workshops provide facilities for instruction in the use of tools, the principles of oxy-acetylene welding, and practical work on the care and maintenance of farm implements and machinery. The Horticultural Department, including the glass houses, were next inspected. Here Mr. O. D. Kimble described the very wide system of instruction given covering flowers, vegetables, and fruit.

A very pleasant meeting, marred only by the somewhat unpropitious weather, was brought to a close by a visit to the poultry farm, accredited by the Ministry of Agriculture and Fisheries, following which the visitors adjourned to the College to partake of tea.

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## The Use of Scientific Instruments in Chemical Analysis

(*Continued from page* 317)

filter transmitting only this wavelength. When this equipment is not available, the filter which causes the maximum photo-cell response should be selected. A series of eight filters is usually supplied with the Spekker, and these may be tried in turn until the most suitable is found. Several types of filter may be obtained; those made of gelatin give a sharp separation of wavelength and are preferable on this account to glass ones. To offset this advantage, however, they are less robust and more susceptible to heat, and for most purposes glass filters are used. Coloured solutions have an application as light filters and lists of selected solutions have been published.[4]

REFERENCES


[1] Goodwin and Morton, *Analyst*, 1946, **71**, 20.
[2] E. J. Vaughan, "The Use of the Spekker Photo-Electric Absorptiometer in Metallurgical Analysis," *Institute of Chemistry Publication*.
[3] Strafford, Wyatt, and Kershaw, *Analyst*, 1945, **70**, 232.
[4] Weissberger, *Physical Methods of Organic Chem.*, **1**, 846.

# Amendment of the Patent Act

THE first and second interim reports of the "Swan" Committee have already been published.

The first report dealt mainly with empowering the Comptroller to grant extensions of term for patents on the basis of war damage or loss under Section 18 (6) of the Patents and Designs Acts. The recommendations of the committee were embodied, *inter alia*, in the Amending Act of 1946.

The Abuse of Patent Monopoly (Section 27), Licences of Right (Section 24), Restrictive Conditions in Agreements, etc. (Section 38), Chemicals, Food, and Medicine (38A), Lack of "Invention" in patent applications, and trial of Patent and Infringement Actions are dealt with in the second report.

Between them the above two reports covered most of the ground opened up by the questionnaire issued by the Swan Committee when it first began its sittings.

The various parties who expressed their views to the committee put forward many suggestions besides those directly dependent on the questionnaire, leaving much ground for the third report to fertilise.

It is understood that the Government contemplates passing another Amending Patent Act in 1948 relating to the second and third reports of the Swan Committee.

A very important matter dealt with by the 1946 Act, besides those above referred to, was the post-war fate of pending enemy patents. Another was the protection of inventions communicated under agreements or arrangements between the Government of the United Kingdom and those of other countries.

In accordance with the powers conferred upon him by the Act, the Comptroller decided not to grant patents on applications emanating from Germany or Japan between September 3, 1938, and December 31, 1945, subject to certain exceptions.

The application of the Section (2) of the 1946 Act between the U.K. and the U.S.A. was delayed by the necessity first of all for settling details of reciprocity between Great Britain and America, owing to the requirements of the famous Boykin Law (Public Law No. 690). The Commissioner of Patents at Washington has now certified that these requirements have been fulfilled, so that the Boykin Law is now operative as between the United Kingdom and the United States. Consequently applicants for basic patents in the United Kingdom can belatedly file corresponding applications in the U.S.A. up to August 8, 1947.

One of the bodies which placed its views before the Swan Committee was the Chartered Institute of Patent Agents.

It is evident that these opinions have been very carefully considered by the Swan Committee. Sections 4, 5, and 6 of the 1946 Act relating to enemy pending patent and design application would appear to embody part of them.

**German-Owned Patents**

In this connexion it is also interesting to note that by an Accord made last year between this country, the U.S.A., France, and many other countries, and which is now in force, many points were dealt with regarding German-owned patents.

According to this agreement, wholly German-owned patents issued and under possession or control of a signatory Government are to be dedicated to the public, placed in the public domain, or continuously offered for royalty-free licence.

Where a signatory Government makes available to its own nationals rights under patents where there was formerly a German interest, other than the patents specified in the preceding paragraph, such rights are similarly to be made available to the nationals of all signatory governments.

With certain reservations, all licences under the two foregoing paragraphs are to include the right to practice and exercise the patented inventions and to make and sell the products of the invention, regardless of the place of manufacture.

Proprietary, licence, or other rights or interests in the relevant patents may be protected or preserved where lawfully granted to or acquired by any non-German before August 1, 1946.

There are provisions relating to the definition of non-Germans, and for a central French office for the transmission of matters of interest between the signatory governments, also for the supply of such information to the said central office, and for inclusion of further governments in the Accord.

Some time ago the Council of the Chartered Institute appointed a Committee to consider, among other things, what would be the possible effects on British industry if a moratorium were to be granted in favour of Allies and neutrals to permit of the filing of belated "Convention" applications and the ante-dating thereof.

The International Convention, in so far as regards patents, is an agreement made between most self-governing States according to which an applicant for a patent for invention in any of the contracting States has the right of applying for

a patent for a corresponding invention in any of the other contracting States within twelve months of the basic application, and at the same time of retaining for priority purposes for those corresponding applications the original basic filing date in the home country. This patent right may have far-reaching consequences as regards the value of a patent monopoly.

**Recommendations of the Council**

The Council does not recommend that after the war enemy nationals should be, by unilateral action of the United Kingdom, denied Convention rights relating to basic applications filed after the end of hostilities, or indeed at such a date that when the British application is filed the twelve months priority period previously referred to will not have expired.

In the view of the Institute the International Convention is reciprocal. To force on any enemy nationals any unilateral arrangement would be contrary to the spirit of the Convention, and as the United Kingdom has ratified that agreement it should adhere to its conditions unless it withdraws from the Convention. Any remedy should be looked for through the contracting States revising the Convention.

A distinction is made, however, between Convention rights in the above category and the fate of enemy-owned British patent applications and patents on file when the war began, as above-mentioned.

It is interesting to note in the above connexion that, although inventions made in Germany after September 3, 1938, are not patentable in the United Kingdom, there will be a safeguarding of rights lawfully acquired by non-enemies before September 3, 1939, in inventions for which patents have been applied for in Germany between September 3, 1938, and September 3, 1939.

In the Peace Treaty in 1919, article 307 arranged a moratorium for the recovery of lapsed patents by payment of renewal fees and performance of formalities without penalty, and allowed a year from the date of the Treaty for so doing. The Institute recommends that such a moratorium should not be granted to enemies after World War II. In addition, if a moratorium be granted to Allies and neutrals under the Peace Treaty, it should not result in there being any recognition that assignment of enemy patents to Allies and neutrals after the entry of enemy States into the war shall confer a right of restoration of such patents.

The Council of the Institute makes a point that it is important that the Allies should take concerted action in these matters and makes its recommendation subject to this proviso.

**Enemy-Owned British Patents**

As regards enemy-owned British Patents that have been kept in force by British licensees (ordinary or emergency), those patents should be vested in the Custodian for the benefit of the licensees in question. In cases where the licensees are exclusive and desire to be placed in a position to take action against infringers, on suitable applications being made by the licensees, and subject to covenant to pay to the Custodian royalties agreed in the licences, the Custodian should assign the Patents to the British licensees.

Should a moratorium be granted whereby Convention applications can be belatedly filed in the United Kingdom based on patent applications filed in Allied, neutral, or "occupied" countries while the war was in progress, the Council indicates two sections of the Patent Acts with regard to which special precautions should be taken. These Sections are Nos. 17 and 27 (2) (d).

The first of these two sections is concerned with the dating of Patents so that their duration can be fixed. Under this section the sixteen-year term of a patent is reckoned from the date on which the complete Specification was filed at the British Patent Office. As the Council of the C.I.P.A. points out it would be possible for an Allied applicant, who has been developing his invention for some five years in the home country during the war under a moratorium as above indicated, to get twenty-two years from his priority date for his patent—that is to say, the aforesaid five years plus the normal sixteen years.

To meet this objection the Council recommends that in such belated Convention cases filed under a moratorium the term of the patent shall be deemed as commencing twelve months from the basic date of application.

Coming now to Section 27 (2) (d), this subsection allows three years from the date of sealing of a patent to elapse before application may be made to the Comptroller for a compulsory licence on the ground of abuse of monopoly rights, the abuse being the refusal of the patentee to grant licences on reasonable terms to the prejudice of United Kingdom industry or trade, established or new.

Supposing, says the Council, that under a moratorium a Convention Application in this country were to be antedated to 1938, the patent would not be open to attack under the subsection mentioned until 1948.

To remedy this, the Council recommends that, where such an ante-dated British Patent is granted either under a moratorium or the Emergency Act, the said patent be open to an application under the subsection in question immediately the patent is sealed.

# The Value of Advertising Abroad

## STATEMENT BY MR. H. A. MARQUAND

Speaking at an "Export Drive" Luncheon of the Advertising Association Conference at Margate on May 20, the Paymaster-General, Mr. H. A. Marquand, M.P., said that however much we might differ about public relations or advertisement at home, there could be no two minds about our need to advertise abroad. We needed to advertise our goods, our scenery, and our travel services. We also needed to make known the truth about the effect of our war effort upon our economy, and our determination in spite of that to pay our way as a nation.

When allocating our very scarce supplies of foreign exchange the Government recognised that adequate advertising was part of our export drive. Applications to the Bank of England for foreign currency for that purpose were sympathetically received. It was hoped that British firms would plan their advertising overseas as part of a thoroughly worked out scheme of export selling and take care not to bring our goods into ridicule by using foreign languages incorrectly in their advertisements.

Mr. Marquand said that this time last year he was doing his best, as Secretary for Overseas Trade, to help to create enthusiasm for our export drive. Everybody was not so convinced of its necessity then as they had become since. He was then criticised for exaggerating the achievement of our export figures. But, except during the summer months, the volume of exports went on rising until November. When he announced the December figures he said shortage of coal and steel would prevent any continued increase during the early months of 1947, and the *Manchester Guardian* said he had once again poured cold water on industry's expectations.

Risking a further rebuke, for over-optimism, Mr. Marquand said that our export effort so far this year was not at all bad. As was known the figures dropped in February and March, but they had risen again in April. Last month the value of our exports reached £82,700,000. That represented about 98 per cent. of the average monthly volume of 1938. Last July 120 per cent. of the 1938 volume was reached, but we did seem to be moving up again. If we took twenty-six days as a normal working month then the value figures for the first four months of 1947 were January, £88 million, February, £82·5 million, March, £82·5 million, and April, £89·5 million.

There were signs that the seller's market for some goods and in some countries was beginning to disappear. Some of the April improvement might have been achieved on the basis of stocks of materials which it was now difficult to replace. Much of it represented production put in hand many months ago. But after all a seller's market was not an unmixed evil for one of the largest buyers in the world. The speaker was confident that our economy was resilient enough, if we worked with a will, to weather the economic storms.

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### Tin Openers Dispensed With

Devised to dispense with the use of a tin opener, the Easycan-top patent closure can be seamed on to any standard metal container, when packed with any type of foodstuff or other commodity.

# Electric Trucks for Transport

## LORD BRABAZON PREDICTS FASTER VEHICLES

Wider use of the electric goods truck, especially for food transport, was urged by Lord Brabazon of Tara, speaking as chief guest at the first post-war luncheon of the Electric Vehicle Association of Great Britain, Ltd., held in London on June 4. Lord Brabazon recalled that the electric vehicle was the first to establish a road speed record (60 m.p.h. in 1899), and that as far back as 1900 a fleet of electric passenger vehicles was operating in London. It was curious that the electric vehicle industry had not better utilised this remarkable start, and had allowed the petrol-driven vehicle to oust it from the roads. Nevertheless, the electric vehicle had established itself as a reliable and hygienic form of transport. It saved fuel and used electricity for charging batteries only at night in off-peak periods. Against these advantages, Lord Brabazon admitted that the vehicle had the demerits of low top speed and limited range. However, the first disadvantage was almost negligible in built-up areas like London where the average speed of traffic was only 7 to 8 m.p.h. The second was more serious. It could be overcome only if the industry carried out an integrated programme of vehicle and battery standardisation. It was high time that an improved battery was introduced; no change had been made in the usual storage battery during the past twenty years. If such a programme were introduced and all the possibilities of modernisation exploited, it was not too much to look forward to a time when the electric vehicle would turn the tables and replace the petrol-driven vehicle.

Sir Felix Pole, President of the Association, followed Lord Brabazon. He thoroughly agreed that it was the policy of making special vehicles using a whole variety of batteries and accessories which had strangled expansion and enterprise. If the industry really wanted to expand, then it must agree upon producing standard, interchangeable batteries embodying the most up-to-date techniques. If this were done, faster vehicles with operating ranges up to sixty miles were within sight.

Other speakers were Mr. A. W. Barham, chairman of the Association, and Sir John Kennedy, deputy chairman of the Electricity Commission. More than 100 members and guests attended the luncheon.

Part of the machinery exhibited on M.V. "St. Merriel" on her tour of South American ports.

### Baking Machinery Afloat

Included in the machinery exhibited in M.V. *St. Merriel*, which has left this country on her tour of South American ports, is a No. 3 Duplex mixer used for mixing all kinds of hard and soft doughs, and for the manufacture of cakes. Provided with a range of speeds, the vertical 3-speed mixer is suited to mixes of all kinds and numerous sizes of interchangeable mixing pans. Further exhibits include a hand-arm kneading machine and an electric pie machine which enables an unskilled operator to raise fourteen dozen pie shells per hour.

All these machines, manufactured by the Morton Machine Co., can be supplied for direct electric or belt drive.

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### Sixtieth Anniversary

Well known for their ice cream mix coolers, enabling a closed circuit to be operated in an ice cream plant, and the British-made Full-Flo heat exchangers for milk and ice cream, the Creamery Package Manufacturing Co., Ltd., is this year celebrating its sixtieth anniversary. Ice cream continuous freezers have also been produced in this country, and it is hoped that homogenisers will shortly become available.

### Automatic Bottle Machine

A new machine capable of automatic production of eight bottles per minute is being constructed by John Moncrieff, Ltd., of Perth. The invention of two Perth men, the machine automatically carries through the blowing of any shape of bottle, performing work which has been generally regarded as being limited to craftsman methods. The firm has secured exclusive patent and manufacturing rights in Britain, and now has five machines under construction. Orders on hand for the machines involve a total expenditure of £50,000, approximate price per machine being £3,000. Bottles which can be produced by this machine include beer, lemonade, oil, ink, or similar types of standardised bottles.

## Industry-Press Co-Partnership

### IMPORTANCE OF LOCAL INDUSTRIES

To achieve increased and more economic production, let industry take into its confidence its employees, their families, potential labour outside its factories, and the communities in which its factories are sited, urged Mr. R. A. Gibbs, President of the Newspaper Society, speaking at the national Advertising Conference at Margate on May 19, on the "Co-partnership of Industry and Press."

"There is an important job to be done to prove to the local community the importance of its local industries," said Mr. Gibbs. "The pay-rolls at the local factories mean more money spent in the community. They provide more jobs, they pay local rates, they sponsor and support community betterment, they promote interest in civic and social affairs, their money is spent in local stores. All these should, I believe, be part of a major policy to create a better understanding of industry."

The more enlightened industrialists, went on Mr. Gibbs, interpreted their annual reports in terms of wages, developments, and welfare services. They told their employees how much business had been done, how much revenue was ploughed back into the business to strengthen its foundations against lean years and to provide for more expansion, better security for the worker in his job and perhaps a little better reward for him. But now, in the Battle for Production, there was a failure to convince employees of the importance of their products and their work. The workers needed to be told what their products represented in the economic welfare of the nation and themselves.

"What industry in this country wants is more friends at its own benches, and more friends can be found among its workpeople if the whole set-up is properly explained," said Mr. Gibbs.

The Press of the country, the local home-going newspapers, as well as the periodical, trade, and technical Press, had a vital job to do in interpreting industry to others. The local papers of the Provinces could do that in every individual community. It was their job to promote the welfare of the community, to interpret local life as they find it, and industry was a major part of local life.

## Electron Jubilee

Fifty years ago, on April 30, 1897, the British physicist, Professor J. J. Thomson (later Sir Joseph Thomson), made the first public announcement of the existence of the electron, and the first approximate estimate of its mass.

The electron is now playing an active and indispensable part in almost every home and every industry. It runs our wireless sets, and plays an active part in television, radar, and many systems of industrial control. The electron industry is one of the largest in the world, and its possibilities are only just beginning to be developed.

The Institute of Physics and the Physical Society, in collaboration with the Institution of Electrical Engineers, is arranging to mark this Jubilee by a series of lectures and other functions in London on September 25 and 26 next. An exhibition, demonstrating the great influence this discovery in pure physics has had on the life of the community, will be opened at the Science Museum, London, on September 26, and will remain open for about three months.

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## Steam Trapping and Air Venting

Steam trapping and air venting installations for space heating systems and cooking and hospital equipment are described in the latest technical bulletin issued by Spirax Manufacturing Co., Ltd.

An introductory section of the Bulletin gives a concise description of the operating principles of the thermostatic type and mechanical type steam traps most commonly in use. Following this is a useful section on the subject of steam trapping troubles, their cause and cure.

Subsequent sections give authoritative recommendations for the draining and air venting arrangements on the particular equipment used in various forms of hot water supply and steam heating. Additional sections deal similarly with kitchen equipment and hospital equipment, and the concluding pages are devoted to graphs of condensate discharge capacities of various types of steam traps.

Every section in the Bulletin is well illustrated.

## Solvent Recovery Plant

The function of the solvent recovery plant manufactured by the London Aluminium Co., Ltd., is to free a proprietary food product from a solvent with which it has been treated in a previous stage of its preparation. The plant is designed so that instead of the solvent being lost it is recovered, and can be used on a subsequent batch of material.

The solid material, saturated with the solvent, is charged to the drier, steam to the jacket turned on, and the agitator started. The agitator is provided with blades which plough through the material, lifting it up and respreading it over the heating surface. The solvent vaporises, and after passing through a filter is condensed in a water-cooled condenser from where it flows to the receiver.

Model of acetic acid recovery plant.

When most of the solvent has thus been removed, air is passed through a steam heated preheater, filtered, and is then passed into the drier where it removes the last traces of solvent. The air-solvent mixture from the drier is then filtered to retain any of the solid entrained and is then led to the carbon column containing activated carbon which retains practically all the solvent. A steam ejector is used to draw air through the plant.

After several batches have been dried, the carbon becomes saturated and will no longer retain solvent. Live steam is then blown into the carbon to vaporise the solvent and the solvent-steam mixture passed to the condenser, when the mixture condenses, runs to the receiver, and the solvent and water separate into two layers, the solvent being separately removed. When removal of solvent is complete, cooling water is circulated through the drier jacket thereby cooling the solids, after which the material is discharged at the bottom outlet.

## "Design Weeks"

At the close of the "Britain Can Make It" Exhibition it was announced that a series of "Design Weeks" would be held in the leading industrial centres of this country. The Council of Industrial Design, in co-operation with the Federation of British Industries and the Association of Chambers of Commerce and with the full support of the Civic Authorities, has now completed the preliminary plans for these "Design Weeks."

The first "Design Week" will be held in Newcastle-on-Tyne from July 7 to 12 inclusive. Other cities where "Design Weeks" will be held include Manchester in September, Birmingham in November, Cardiff in January, 1948, and Bradford in March, 1948.

**The one-ton electric vehicle equipped as a travelling butcher's shop.**

### Travelling Butcher's Shop

A battery electric vehicle equipped with a special body is being tested by the St. Helen's Industrial Co-operative Society, Ltd.; for their travelling butchery service.

Manufactured by Crompton Parkinson, Ltd., the vehicle is equipped with steel rails, hooks, and other fitments common to a retail butchery. Counter and shelves are easily removable for cleaning, and sliding windows in both sides of the body allow the meat to be displayed. Interior lighting and air conditioning is provided, and a false roof gives heat insulation to protect the meat.

A wash bowl and towel rack fitted in the rear side of the cab provide facilities for the driver to wash his hands before serving.

**Fitted with a special all-metal body built by Normand, Ltd., the new Commer "Superpoise" 3-4 tonner incorporates many new improvements.**

### The Albert Medal

The Council of the Royal Society of Arts have this year unanimously decided to award the Society's highest honour, the Albert Medal, to Sir Robert Robinson, M.A., D.Sc., LL.D., F.R.S., Waynflete Professor of Chemistry in the University of Oxford and President of the Royal Society, "for his outstanding contributions to the advancement of organic chemistry."

During the last thirty years Sir Robert Robinson has become the recognised leader in this science. More than any other organic chemist he has made contributions of the highest importance to our knowledge of the mechanism of organic chemical reactions which have inspired other workers in organic chemistry everywhere. Science and an appreciation of harmony in nature, combined to make his studies of the constitution of the colouring pigments of flowers a delight not only to chemists but also to all who appreciate natural beauty. The manner in which he has indicated how plant alkaloids may be evolved in nature and his contributions to the elucidation of the difficult problem of the constitution of the alkaloids of the strychnine group have never been surpassed by any previous worker.

The Society will always remain indebted to him for the knowledge and genius which he has exercised in his syntheses of compounds of the sterol group and other hormones, whereby healing and alleviation of physical suffering may be achieved. His recent contributions to the chemistry of the antibiotic substances, particularly of the penicillins, will prove to be of the greatest importance and benefit to mankind.

### Catering Exhibition

Last held in 1937, the Hotel, Restaurant, and Catering Exhibition is to be revived next year. Promoted by the proprietors of *The Caterer and Hotel Keeper* and *The Hotel Review* and organised by Trade and Technical Exhibitions, Ltd., the Exhibition will take place in the National Hall, Olympia, from January 16 to 24, 1948.

## Pasteurising Plant

Constructed with interior and exterior surfaces entirely in polished stainless steel, the short-time pasteurisation plant described in a recently published brochure issued by the Aluminium Plant and Vessel Co., Ltd., has a wide range of capacity dealing with from 400 to 2,000 gal. of milk per hour in a single frame and up to 3,000 gal. per hour with a single panel.

Complete accessibility, reduced piping, and stainless steel surfaces reduce cleaning labour to the minimum. A uniform rate of flow is achieved automatically, and an improved flow diversion valve, with no milk glands, ensures positive diversion and resets automatically.

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## Science and Gastronomy

Containing official news of the British Dietetic Association and the Food Education Society, and aimed at contributing towards the solution of the world's food problems by "co-ordinating technical data, stimulating the flow of information, and encouraging the application of dietetic facts to practical catering," the new quarterly journal, *Nutrition, Dietetics, Catering*, should prove invaluable to manufacturers of foods and catering equipment in keeping them in touch with research results which may affect their production or marketing policy.

In his foreword to the first issue, Sir Jack Drummond, D.Sc., F.R.I.C., F.R.S., says that this journal must take its place in the front rank of the attack on bad cooking and bad catering in this country, and help, with the co-operation of the cook and the dietitian, to restore a wide respect for the tradition of good sound English cooking.

This issue presents an international survey of food in all its aspects: Prof. J. R. Marrack on food or nutrients, Miss J. Isobel Mills on the diploma course in dietetics at Leeds, Miss Diana J. Ten Haaf on the food supply of the Netherlands during the war, Prof. John Yudkin on nutrition in West Africa, and Mrs. D. Eirene Palmstrøm on food habits in Norway.

## Twenty-Five Years' Service

On May 1, Mr. Karel Bohemen, a director of Polak and Schwarz (England), Ltd., completed twenty-five years with the firm, and a luncheon was held in his honour at the Royal Forest Hotel, Chingford. The occasion was

**Mr. Schwarz presenting Mr. Bohemen with a medal and scroll.**

specially marked by the presence of the director, Mr. A. Schwarz, from the Head Office in Zaandam, Holland, and his family. Representatives from various parts of England and all members of the staff attended.

Tribute was paid by Mr. Schwarz to the excellent service rendered to the firm by Mr. Bohemen, and several presentations were made.

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## Diesel Engine Power

To alleviate as much as possible the effects of public power supply shortage, the Ministry of Supply, under Cabinet directive, have investigated the capacity in this country to produce Diesel oil engine units for installation as private power plants.

Official priority has been given to the release of materials needed for a comprehensive manufacturing programme for Diesel engines, with and without electrical machinery, by Davey, Paxman, and Co., Ltd., of Colchester. This programme makes use of the war-time manufacturing capacity of the Paxman organisation for production of both Diesel generating sets of various sizes between 65 k.v.a. and 380 k.v.a., and Diesel engines for non-electric drive of compressors, pumps, line shafting, etc. The total electric power of the Paxman emergency programme amounts to about 150,000 k.v.a., plus a considerable amount of non-electric units, and is valued at five million pounds.

Allocation of these engine sets is being arranged strictly in rotation according to date of receipt of order, and is subject to Ministry approval of the essential nature of the individual purchaser's requirements.

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## Ice Cream Guide

A guide to the new Ice Cream Regulations has been circulated to all members of the Ice Cream Alliance. Stress is laid on the position of manufacturers who have hitherto used cold mix powders, a practice which is now prohibited unless such powder is a complete cold mix subjected to heat treatment during course of manufacture and requiring only the addition of cold water. Even then the mix must be frozen within one hour of adding the water.

The suggestion is made that members of the Alliance who have been using cold mix powders as a stabiliser and do not possess a boiler for the heat treatment process may be able to arrange for another manufacturer, having the necessary equipment, to make up mixes for them. Branch Secretaries of the Alliance will endeavour to place members requiring this service in touch with such manufacturers in their locality.

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## Diamond Jubilee Celebration

Commemorating sixty years devoted to "the art of boiler-making," the Farrar Boilerworks, Ltd., have published a Diamond Jubilee Catalogue giving particulars of their wide range of manufacture. Further sections, including air receivers, chemical plant, welded, riveted, and pressed work, are in course of preparation.

# Sanitary Inspectors Discuss Ice Cream

## ADDRESS BY MR. L. J. HYNES

Opening his talk at the annual general meeting at the Yorkshire Centre of the Sanitary Inspectors' Association, held at Leeds on May 3, with a strong plea for mutual co-operation between sanitary inspectors and ice cream manufacturers, Mr. L. J. Hynes said that both were working to achieve the manufacture and sale of ice cream on strictly hygienic lines.

Emphasising the fact that the new heat treatment regulations had not been opposed by the trade, Mr. Hynes said there was a strong feeling among the smaller manufacturers that in view of the shortage of the necessary machinery the introduction of the regulations should have been postponed. In view of the fact that in many cases it would be extremely difficult for manufacturers to comply with certain of the requirements, particularly those affecting the cooling of the heated mix and its maintenance at a temperature not exceeding 45° F., Mr. Hynes made an earnest appeal to sanitary inspectors to bear these difficulties in mind when administering the regulations.

In his opinion, the regulation affecting the use of a completely cold mix needed some amendments. As that regulation stood, it was illegal for an ice cream manufacturer to enrich a cold mix by replacing some of the water with fresh cream when this became available, even though he heat-treated the cream in accordance with the regulations and added it, after cooling within the specified time, to the rest of the mix at the freezer itself.

Discussing the question of standards, Mr. Hynes explained the difficulties of framing a satisfactory and equitable standard, and in conclusion gave details of the standard proposed by the Ice Cream Alliance, showing how it would affect both the large and small manufacturers.

### Appointment of Selling Agents

The distribution of the automatic wrapping and heat sealing machines manufactured by Georges Dubois of France is to be undertaken in Great Britain and the British Empire by their sole selling agents, Ideal Packagings, Ltd.

An associate of this company, Ideal Export Import, Ltd., have accepted similar sole selling agencies for tablet- and pill-making machinery manufactured in Zurich by Conrad Sigg.

### Antidote to Pilfering

A simple means of preventing the pilfering of parcels during rail transit is being used by a number of manufacturers and wholesalers who are using clear transparent Sellotape, the self-adhesive cellulose tape.

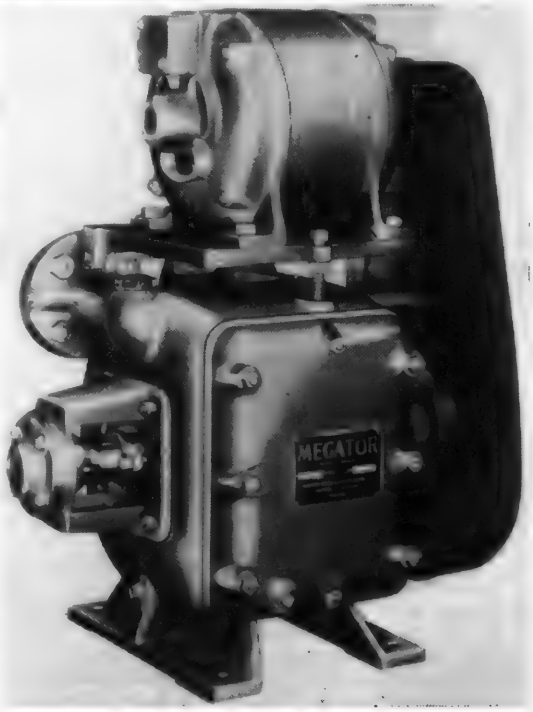
Serving as a seal as well as a sealing agent, this tape tends to pull the paper with it, and if an attempt is made to re-seal the package the damage remains discernible through the clear transparent film.

### Food Pumps

Ease of dismantling is a feature of the range of food pumps manufactured by Megator Pumps and Compressors, Ltd., the removal of the front cover being all that is necessary to open up the whole pump for inspection, cleaning, or sterilisation.

The mechanism consists essentially of a rotor comprising three eccentric discs, and three "shoes" of plastic material which envelop the rotor discs and bear against a vertical cover plate forming the division between the suction and delivery chambers. The movement of the rotor creates the required displacement within the shoes, which for their part perform an up-and-down movement and so control the admission and discharge of the liquid through ports in the cover plate. The action results in an efficient and simple pumping unit, capable of dealing with a wide range of liquids including those of a viscous character.

Produced in cast iron, bronze, and other special materials to meet the many requirements of the food industries, there is no metal-to-metal moving contact, and the development of the design has resulted from the utilisation of plastic materials, which have the further advantage of freedom from corrosion or contamination. The pumps are self-priming, dealing simultaneously with liquid and air in any proportions, and once filled with liquid they can be left running with a dry suction without requiring a by-pass.




**Ease of dismantling is a feature of this food pump.**

## Glaze for Baking Tins

Recently developed by the Dow Corning Corporation is a "Silicone" product now being used commercially to prevent the sticking of bread and rolls to baking cans. Bread baked in pans thus coated is evenly browned on top and bottom.

Depending upon the condition of the pans and the handling they receive, a single application of pan glaze has given easy release for as many as 100 to 200 baking cycles. The cost of using the glaze is therefore only about one-tenth as great as the conventional greasing and cleaning of pans. In addition to reducing material and labour costs, its use will give a striking improvement in the appearance of the product.

The British distributors of this product are Albright and Wilson, Ltd.

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## Appointments

Dr. F. N. Woodward has been lent to the Department of Scientific and Industrial Research for appointment as Director of the United Kingdom Scientific Mission in the British Commonwealth Scientific Office in Washington. The present director, Dr. Alexander King, is shortly returning to the United Kingdom to take up an official appointment. Dr. Woodward is at present Director of the Scottish Seaweed Research Association, and during the war was on the scientific staffs of the Ministries of Supply and Production.

*

Mr. J. C. Taylor, A.M.I.Mech.E., M.Inst.R., has been appointed Managing Director of U.D. Engineering Co., Ltd., in succession to Mr. E. A. Shepheard, who has held that position since the formation of the Company.

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The following Officers and Executive Committee will serve the Industrial Pest Control Association for the year 1947:

*President:* Mr. Angus F. McIntosh (Thomas Harley, Ltd.).
*Vice-President:* Mr. G. McLaren (Haller Laboratories, Ltd.).
*Hon. Treasurer:* Mr. S. F. Sprange (London Fumigation Co., Ltd.).
*Hon. Auditors:* Mr. T. A. Acton (B. L. and N. Phillips, Ltd.), Mr. D. R. Leitch (Ratsouris, Ltd.).

*Executive Committee:*
Dr. F. P. Coyne (Imperial Chemical Industries, Ltd.).
Mr. J. W. Hedgcock (Chelsea Insecticides, Ltd.).
Mr. W. Hivey (Hivey Fumigation Co., Ltd.).
Mr. C. Stuart-Kregor (W. Edmonds and Co., Ltd.).
Mr. R. P. Merritt (Stafford Allen and Sons, Ltd.).

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Mr. Richard P. Carr, M.B.E., M.C., has been appointed a director of Peak, Frean and Co., Ltd., as from June 1, 1947.

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## Low Temperature Research Station

The appointment has been announced of Dr. Franklin Kidd, F.R.S., Superintendent of the Low Temperature Research Station, as Director of Food Investigation, D.S.I.R. The vacancy was caused by the resignation of Dr. C. S. Hanes, F.R.S., who is taking up an appointment as Head of a Unit of Biochemistry at Cambridge University.

Dr. E. C. Bate-Smith, M.Sc., Ph.D., Senior Principal Scientific Officer at the Low Temperature Research Station, has been appointed Superintendent of the Station. Both these appointments date from April 1.

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## Floor Heating

Food manufacturing premises of the future may use floor heating as an alternative to space, wall, or roof heating systems, at a quarter or half the cost of existing comparable heating if present experiments are approved by designers and industrialists.

One factory has been fitted with such installation in Scotland, while others are in process of negotiation. In the factory concerned the concrete floor was warm to the touch, dust-proofed, and painted with a suitable paint. It is understood that one problem associated with any system of floor heating, the development of hot spots, has been overcome and that an overall heat is assured.

## Save the Dollars

That increased output from this country would save the expenditure of the £725 millions this year on imported food and supplies for agriculture is the suggestion contained in *The Industrial Charter*, a statement of Conservative Industrial Policy issued by the Conservative and Unionist Central Office.

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## Packaging Competition

The judging of entries for the Packaging Competition recently sponsored by the Metal Box Co., Ltd., has now been completed. Generally speaking, the standard of design was not good, and the judges therefore felt themselves compelled to invoke Rule No. 12 of the Conditions of Entry, which empowered them to withhold the whole or part of the prize money in any section.

Cheques have been forwarded to the following prizewinners:

(1) *Professional Designers:* Norman Carter, F. Winch, R. J. Jackson, Bernard J. Gibbs, Leslie Shearer, L. Piatkowski, Raymond Davids.
(2) *Non-Professional Designers:* D. C. Morton, F. C. Leach, M. Cameron Pollock, A. C. King, J. M. Mexley.

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## New Flour Mill for Leith

A new flour mill is planned for Leith, where the Scottish Co-operative Wholesale Society, Ltd., has secured a ninety-nine year lease of a site in the reclaimed area for a flour mill. This, following the recent announcement by the Rank group, means that Leith will be increasingly developed as a flour milling and grain handling port and distributing centre.

Developments of this scheme, which aim at the reclamation of the area by construction of deep-water quays and construction of a modern flour mill, will follow on the availability of material, labour, and other facilities, but the proposed construction is to be pressed forward at the earliest possible date.

# Mechanical Engineering Research

## NEW ORGANISATION FORMED

The Government, through the Department of Scientific and Industrial Research, is setting up a special organisation to carry out scientific research in mechanical engineering to meet and, further, to anticipate the needs of industry and Government departments. The eventual annual expenditure will be in the region of £250,000 to £350,000, although it is unlikely that this figure can be reached for some years because of the present difficulties in obtaining suitably qualified staff and buildings. The research is intended mainly to supplement the research carried on in other research organisations in this country, and will largely be confined to those fundamental problems which underlie all mechanical engineering. Thus the subjects in which research is expected to be carried out are:

(*a*) Properties and strength of materials.

(*b*) Mechanics of solids, stress, stability, and vibration of structures.

(*c*) Mechanics of fluids; aerodynamics, gas dynamics, and hydraulics in their mechanical engineering applications.

(*d*) Lubrication, wear and mechanical engineering aspects of corrosion.

(*e*) Mechanisms, engineering metrology, and noise control.

(*f*) Mechanics of formation of materials; machine shaping of materials.

(*g*) Heat transfer, heat exchange apparatus, and applied thermodynamics.

Dr. G. A. Hankins, D.Sc., M.I.C.E., M.I.Mech.E., Superintendent of the Engineering Division of the National Physical Laboratory, D.S.I.R., has been appointed Director of Mechanical Engineering Research.

As with all other research organisations in the D.S.I.R., the Director will be advised by a Board, consisting of eminent scientists, technicians, and industrialists, serving in their personal capacity and not as representatives of any organisation to which they may belong. The composition of the Mechanical Engineering Research Board, which had its first meeting on May 22, is as follows:

*Chairman:* Dr. H. L. Guy, C.B.E., M.I.C.E., M.I.Mech.E., F.R.S.

*Members:* Mr. L. Akehurst. Operative, London Passenger Transport Board.

Prof. R. N. Arnold, D.Sc., Ph.D., M.I.Mech.E., A.M.I.C.E. Professor of Engineering, University of Edinburgh.

Dr. S. F. Dorey, C.B.E., D.Sc., M.I.C.E., M.I.Mech.E., M.I.N.A. Chief Engineer Surveyor, Lloyd's Register of Shipping.

Sir Claude Gibb, C.B.E., M.I.Mech.E., F.R.S. C. A. Parsons and Co., Ltd.

Dr. H. J. Gough, C.B., M.B.E., D.Sc., M.I.Mech.E., F.R.S. Engineer in Chief, Lever Bros. and Unilever, Ltd.

Sir William Halcrow, M.I.C.E.

Mr. M. B. Hoseason, M.I.E.E. Brush Electrical Co., Ltd.

Dr. C. H. Lander, C.B.E., D.Sc., M.I.C.E., M.I.Mech.E., F.Inst.P. Principal, Military College of Science.

Prof. N. F. Mott, F.R.S.

Prof. D. M. Newitt, M.C., F.R.S. Professor of Chemical Engineering, Imperial College.

Sir Ewart Smith, M.I.Mech.E. Imperial Chemical Industries, Ltd.

Prof. H. W. Swift, D.Sc., M.I.Mech.E. Professor of Engineering, University of Sheffield.

Dr. C. Sykes, F.Inst.P., F.R.S. Director, Brown-Firth Research Laboratories.

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### Bulk Handling of Materials

Claimed to be likely to open up new possibilities not only for the bulk handling of solids, but also for the handling of such materials as flour, tea, sugar, rice, and cocoa, as well as in the heavy and chemical industries and public utility undertakings, the new "Mucon" valve is being placed on the market by Kilcoin and Partners, Ltd.

Another product made by this company is a semi-plastic material moulded or extruded in any suitable size or shape. This is positioned in the mould or shuttering of concrete before it is poured, and saves making holes in the finished concrete to take fixtures.

### Grain Driers and Harvesters

Information on grain driers and combine harvesters is contained in a publication, *Combine Harvesting and Grain Drying*, issued by the National Federation of Gas Coke Associations, price 2s. 6d. net.

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### S.C.I. Food Group

At the sixteenth annual general meeting of the Food Group of the Society of Chemical Industry held on April 23, Mr. T. Rendle in the chair, the following committee members were elected for the coming session:

| | |
|---|---|
| A. J. Amos. | S. H. Edgar. |
| A. Andersen. | J. G. Huntley. |
| J. H. Bushill. | G. H. Lea. |
| L. E. Campbell. | T. Moran. |
| H. E. Cox. | R. H. Morgan. |
| J. G. Davis. | S. M. Tritton. |

The appointment of officers for the 1947-1948 session was announced in the May issue of FOOD MANUFACTURE.

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### Bakery Research

In a letter addressed to the members of the baking industries, Mr. John B. M. Coppock, Director of Research, British Baking Industries Research Association, sets out the proposals to establish at the earliest opportunity a Research Institute equipped with laboratories and experimental bakery and staffed by professional and technical experts, where the many problems associated with manufacturing operations from the raw materials to the final product may be studied.

It is also the desire of the Association to place at the disposal of the baking industry an information service and library for investigation and solution of the problems of the baker.

In order to enable the Association to give its members throughout the country the scientific service so necessary to the industry's continued prosperity, Mr. Coppock appeals for collaboration and financial support which is supplemented by a grant made by the Government through the Department of Scientific and Industrial Research, provided the industry finds a minimum amount of £12,000 per annum.

## Lighting in Industry

Based on a report submitted by the Lighting Service Bureau of the Electric Lamp Manufacturers' Association of Great Britain, Ltd., the recently published memorandum on lighting in industry states that the observations and recommendations contained therein could serve a wider purpose by enabling those concerned with industrial management, administration, and welfare to assess the merits of their own lighting installations and of lighting schemes under consideration.

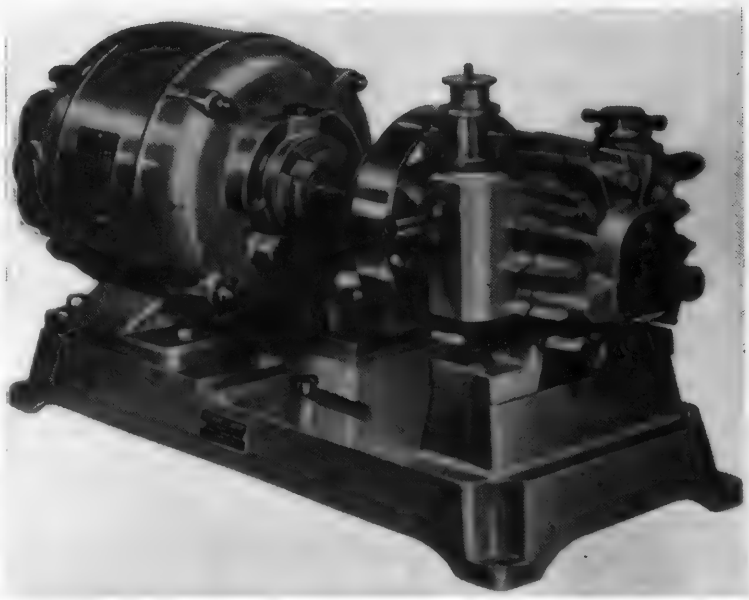
In the present state of manpower and fuel stringency it should be a matter of concern to all managements and executives that their lighting combines effectiveness with economy. This aim will be the better realised when the interest which managements display in the lighting of their work-places is backed by a clear idea of their objective and appreciation of the contribution that good lighting makes towards better working conditions.

## Wrapping for Frozen Food

A new sanitary packaging material, F.F. Pliofilm, evolved by the Goodyear Tyre and Rubber Company to eliminate freezer burn, effectively controls moisture transmission, remains flexible at sub-zero temperatures, and stays transparent for visual inspection of the product.

F.F. Pliofilm has been given exhaustive tests with excellent results, and possesses the same heat-sealing qualities of conventional Pliofilm which has proved so successful in the States in the packaging of fresh fruits, vegetables, meats, cheese, and other items.

Freezer burn, a common deficiency of food freezing, due to dehydration, can be eliminated with this new film when packaging is properly done. As an example, sliced apples, tested for a nine-month period at −20° F., showed only a ·05 per cent. loss in weight, yet they remained clear, white, attractive, and retained their natural flavour. Strawberries, peaches, nectarines, meats, chickens, and turkeys have also been tested with good results.



**The type IV compressor and vacuum pump manufactured by W. Edwards and Co. (London), Ltd., is extensively used for operating all types of filling machines for liquids.**

## Nickel Cast Iron for Engineers

Describing the various types of alloy cast-iron obtainable by the use of nickel, and their mechanical properties, the publication in revised form issued by the Mond Nickel Co., Ltd., provides engineers and designers with information on which to base the choice of suitable irons for specific purposes.

## Charter for Foremen

A pamphlet, under the title of *A National Charter for Supervisors and Technicians*, has recently been issued by the Association of Supervisory Staffs, Executives, and Technicians. This Charter demands that all supervisors employed in industrial undertakings should be paid a minimum salary of £500 per annum. The contention is made that the majority of foremen are being underpaid.

The Association aims to secure a standardised minimum salary with additional bonuses based on length of service and number of staff supervised. The claim is also made that employers should recognise the status of foremen.

## Welsh Exhibition

A variety of products will be displayed at the "Industrial Wales" Exhibition to be held at Olympia from August 28 to September 13, and since coal is the foundation of Welsh industry, it will have a premier position in representation. The tweeds and flannels for which Wales has been famous for centuries will be well represented, also the interesting rural crafts of Wales.

## New Anglo-Belgian Exhibition

An exhibition will be held in the Salle de la Madeleine, Rue Duquesnoy, Brussels, from September 4 to 9 inclusive this year, to show the products of British manufacturers to buyers for the European markets. It is being organised by H. and H. Trading (London), Ltd., and designed by Ian Jeffcott.

## OBITUARY

We regret to announce the death, on May 10, of Mr. Francis Charles Edwin Jones, managing director of Edwin Jones and Sons (London), Ltd.

# International Congress of Chemistry

## PROVISIONAL PROGRAMME

**The following are details of the provisional programme of the Sixteenth International Congress of Pure and Applied Chemistry to be held in London from July 17 to 24.**

***Wednesday, July 16:***

*Hours.*

18.00. Registration of Members and Delegates at Congress Headquarters.
21.00. Informal Reception of Delegates and Members.

***Thursday, July 17:***

*Hours.*

10.30. Opening Ceremony by the President of the Congress at Central Hall, Westminster.
13.00. Luncheon.
14.30. Congress Lecture by Dr. L. Pauling, B.S., Ph.D.
15.00. Garden Party.
18.00. Reception at Royal Institution (by invitation).
21.00. Reception of Delegates and Members by the Royal Society.

***Friday, July 18:***

*Hours.*

12.30. Meetings of Sections, South Kensington.
12.45. Luncheon offered by the Society of Chemical Industry.
14.30. Congress Lecture by Sir Henry Dale, O.M., G.B.E., F.R.S.
15.00. Ladies' Fashion Parade.
15.30. Meeting on Abstracting Literature and Documentation.
21.00. Visit to Theatre.

***Saturday, July 19:***

*Hours.*

12.30. Meetings of Sections, South Kensington.
18.00. Day Excursions.
14.30. Motor-coach tour of City of London.
19.30. Buffet Dance, Grosvenor House.
20.00. Congress Dinner.

***Sunday, July 20:***

*Hours.*

18.00. Day Excursions.
11.00. Religious Services.

***Monday, July 21:***

*Hours.*

12.30. Meetings of Sections, South Kensington.
10.00. Ladies' Shopping Parties, with guides.
14.30. Congress Lecture.
17.00. Ladies visit Kew Gardens.
15.30. Congress Lecture.
17.00. Reception of Overseas Members.
21.00. Reception of Congress Delegates and Members at the Guildhall.

***Tuesday, July 22:***

*Hours.*

09.00. Meetings of Sections.
18.00. Visit to I.C.I. Plastics Division, Welwyn.
12.45. Luncheon offered by Imperial Chemical Industries, at the Dorchester Hotel.
12.45. Ladies' Subscription Lunch, at the Connaught Rooms.
14.30. Congress Lecture by Prof. L. Hackspill.
17.00. Motor-coach Tours.
21.00. Reception of Congress Delegates and Members, at Grosvenor House, offered by the Royal Institute of Chemistry.

***Wednesday, July 23:***

*Hours.*

09.00. Meetings of Sections, South Kensington.
09.30. Day Trip for Ladies.
12.45. Luncheon offered by the Chemical Society to Council of the International Union for Chemistry.
14.00. Congress Lecture.
14.00. Tour of London Museums.
15.00. Meetings of Sections, South Kensington.
19.30. Gala Dinner.

***Thursday, July 24:***

*Hours.*

10.30. Closing Session of the Congress. Lecture by Sir Robert Robinson, President of the Royal Society, Central Hall, Westminster.

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### American Government's Award

**At a ceremony at the American Embassy on May 1, Mr. J. Davidson Pratt, C.B.E., M.A., B.Sc., M.I.Chem.E., F.R.I.C., Director and Secretary of the Association of British Chemical Manufacturers, was awarded by the American Government the Medal of Freedom with silver palms for exceptionally meritorious work and co-operation with the United States while Controller of Chemical Defence Development at the Ministry of Supply from 1940-1945.**

### Changes of Address

**The new address of Mac-Rex Food, Ltd., is now 2, Beech Road, St. Albans, Herts.**

*

**Mrs. S. M. Tritton, consulting chemist, is removing her practice to the Grey Owl Research Laboratories, Knowle Park, Almondsbury, Nr. Bristol.**

*

**From May 27 all departments of Pearks, Ltd., will move from 179, City Road, E.C.1, to 78/81, Clifton Street, London, E.C.2, telephone number, Bishopsgate 3272, where their grocery warehouse is also located.**

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### Industrial Hire Purchase

**During the next few years the replacement of worn-out machinery and the re-equipping for peace-time production is going to be a major problem, and industrialists would be well advised to look thoroughly into the question of hire purchase before budgetting for equipment.**

**A booklet entitled *The Use of Hire Purchase in Industry* has been issued by Mutual Finance, Ltd., and will be found of great help to industrialists faced with the prospect of extending or replacing existing plant.**

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### United Glass Bottle Manufacturers

**At the thirty-fourth ordinary general meeting of the United Glass Bottle Manufacturers, Ltd., Sir Walrond Sinclair, K.B.E., chairman, announced the payment of a final dividend of 7½ per cent. and a cash bonus of 2½ per cent., less tax.**

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### Cerebos Ltd.

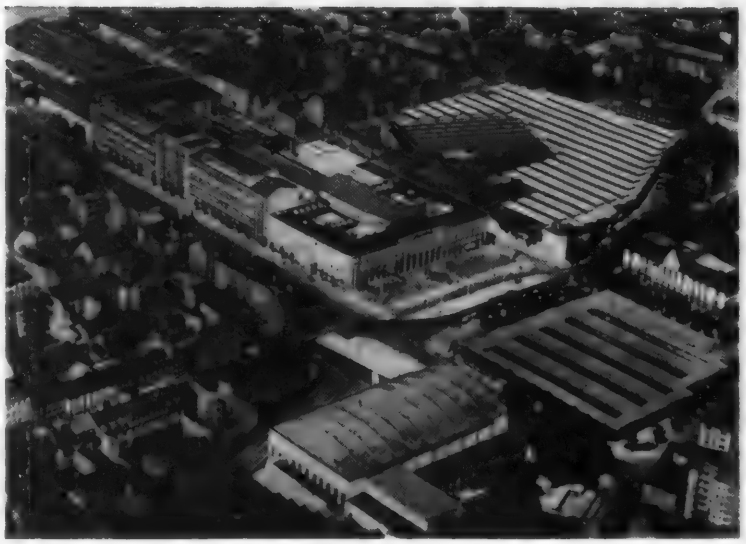
**At the forty-third annual general meeting of Cerebos, Ltd., Mr. J. Weedy, deputy chairman, presiding, it was recommended that out of the available balance should be declared a final dividend of 30 per cent., less tax, which, with the interim dividend paid in November last, makes 40 per cent., less tax, for the year.**

# OVERSEAS ITEMS

## Swiss Industries Fair, 1947

The part played by refrigeration in preventing food wastage was a feature of the food section of this year's Swiss Industries Fair held at Basle from April 12 to 22. Refrigerated show cases for the display of perishable food in restaurants and snack bars were exhibited. Refrigerator cabinets partitioned to seal off from each other different classes of perishable foodstuffs were offered in a wide range from ordinary domestic models to the more varied types for catering establishments.

The general atmosphere was one of success and sales, and it is quite certain that the volume of orders taken vastly exceeds anything known in pre-war years.



**The site of the Swiss Industries Fair, Basle.**

## Italian Tomatoes

The Piacenza and Parma regions in which most of Italy's tomato preserving factories are concentrated are optimistic regarding the supply of tomatoes this year. The acreage under tomatoes exceeds considerably that of last year, due to the fact that bad weather spoilt many of these crops, and farmers are using the fields for tomatoes.

The growers are insisting on fixing delivery prices long in advance, while the manufacturers prefer to have some idea of available quantities before a decision is reached on price. This same difficulty was satisfactorily settled last year, and will not necessarily influence the situation.

## New Plastics Solvent

The Celanese Corporation of America announces that a newly developed plastics solvent, methylal, is to be made available to the market in large quantities. It is a diether, equal to ether or acetone for certain applications, according to the manufacturers. The product has a high solvency for many plastic materials such as cellulose nitrate, ethyl cellulose, and polystyrene, and for other resins and a wide group of organic compounds. Produced from natural gas in the company's Texas plant, methylal is said to have a low boiling point, a relatively high water solubility, the ability to be salted out of solution, and a stability towards alkalis pointing to its use as a vaporising extraction, or reaction solvent in many industrial processes.—*Reuter.*

## Egypt's Rice Industry

Rice cultivation is extending more and more in Egypt, particularly in the Delta Zone, where the standard of irrigation is higher and the dampness of the land most suitable.

The rice acreage varies continually, and largely depends on the amount of water which can be provided. In 1945, the acreage amounted to 700,000 feddans (one feddan equals 4,200·8 square metres), while the area planted with rice for the current season is estimated at 678,000 feddans. The yield per feddan varies between ten to twenty ardebs (one ardeb equals 150 kilograms), largely depending on the type of land and irrigation facilities.

There are more than 260 mills for threshing rice in Egypt, with a total production of approximately 855,000 tons a year. The number of mechanical looms used for the various processes of peeling and cleaning the rice is very limited, and the majority of mills operate with inadequate equipment and adopt primitive methods, which is the reason why Egyptian rice contains a larger proportion of foulness than foreign rice.

The different varieties produced in Egypt are: Crude rice or "Paddy" rice, white rice or completely cleaned, and bran rice.

Although today the rice crop is almost double that of pre-war years, it could still be substantially increased if Egyptian mill owners modernised their equipment. Apart from complete exhaustion, due to the uninterrupted work during the war years, the present equipment is obsolete and its renewal deemed most urgent, more so now that Egypt exports her rice surplus—the current season's quota amounting to approximately 200,000 tons valued at £E6,000,000.

Last year rice came a distant second after cotton in the list of Egypt's exports with a total value of approximately £E5,000,000.

## Erratum

The note Soviet Vitamin D Factory, published on page 234 of the May issue of FOOD MANUFACTURE, should have read Polish Vitamin D Factory.

### Canned Horse

Europe is to receive as canned meat some sixty thousand Canadian farm horses displaced by mechanisation.

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### Egypt's Chocolate Industry

Egyptian chocolate manufacturers have drawn up a programme with a view to raising the standard of their industries. New equipment has been ordered from abroad and a number of projects for their amelioration and expansion have been put on paper.

The following suggestions have been submitted to the Government by the Egyptian Federation of Industries:

1. To stop all foreign imports unless Egypt is given the same access and rights to raw materials as other countries.
2. To free the export of cocoa and chocolate, while providing a drawback for the sugar contained.
3. To abolish Customs duties on raw materials and packing materials.
4. To obtain priority from Arab States for the import of Egyptian chocolate and products thereof.
5. To exempt from duty the new equipment ordered abroad.

### French Meat Output

French meat production for 1947 is estimated at 1,400,000 tons, compared with a production of 2,650,000 tons in 1939, according to one of the directors of the General Confederation of Agriculture in Paris.

Consumption of meat, on the other hand, is estimated to reach about 2,000,000 tons this year against 1,700,000 in 1938.

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### Sugar for Irish Food Manufacturers

It is expected that Irish food manufacturers will be allocated twenty thousand tons of sugar, due to reach Eire from Peru.

This consignment of raw sugar, which will be refined in Eire, is part of the Irish plan to import as much sugar as possible. With the 60,000 tons produced by the Irish Sugar Company this season, the Peruvian sugar will bring the total supply to 80,000 tons—the amount consumed last year on the basis of the ¾ lb. domestic ration and the allocations to Irish industry.

### Italian Cheese Shortage

Production of cheese in Italy this year is not expected to be more than 65 per cent. of pre-war production. It will only be possible to assign about 1,800 million litres of milk to the cheese industry, and the estimated 1947 production is 148,500 tons of cheese. Normally the yearly output of cheese often exceeded 220,000 tons.

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### U.S. Frozen Orange Juice

A frozen orange juice semi-concentrate, which tastes like fresh juice, has been developed by U.S. Department of Agriculture scientists. The product is stored at low temperature and made ready for drinking by diluting with three parts of water to one of juice. The process is as follows: orange juice is vacuum-concentrated to about five-fold, and fresh juice is added to reduce the mixture to a four-fold concentration. The addition of fresh juices replaces much of the flavour lost in the vacuum-concentration process. This four-fold concentrate is then quick frozen and marketed through frozen food channels.

# News from the Ministries

### Appointments and Resignations

The position vacated by Mr. R. Gray, M.B.E., M.A., LL.B., J.P., on his resignation as the Divisional Food Officer for the South-East of Scotland Division, has been filled by the Deputy Officer, Mr. C. O. Monro.

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Sir Rolande Wall, who resigned from the post of Deputy Secretary and Head of the Supply Department of the Ministry of Food on December 31, 1946, and since then, at the Minister's request, has undertaken special duties, including a mission abroad, has accepted the Minister's invitation to act as Honorary Commercial Adviser to the Ministry and to continue to place at the disposal of the Department his wide experience of the food trade and his intimate knowledge of the Ministry's systems of procurement and control.

### Fish and Fish Products

The concession under which fish and fish products packed in tins, jars, or other airtight containers could be imported into the United Kingdom from any country was revoked on May 13. Separate import licences are now therefore required for the import of these goods.

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### Change of Address

The Section in the Raw Materials Department of the Board of Trade dealing with cork has now removed from Abford House, Wilton Road, S.W.1. All applications for licences under the Control of Cork (No. 1) Order, 1942, and all enquiries regarding cork should in future be addressed to the Board of Trade, Raw Materials Department, R.M.2C (Cork), Millbank, London, S.W.1 (Telephone No. Whitehall 5140, Extension 798).

### Olive Oil

Although the restrictions on the sale of olive oil to trade users, including catering establishments, were recently removed, it is pointed out that for the time being there is likely to be little improvement in supplies of olive oil and most of it will continue to be reserved for medicinal purposes.

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### Soya Flour

An Order came into force on May 11, 1947, amending the Soya Flour (Control and Maximum Prices) Order.

The amending Order provides for an increase, due to the increased cost of soya beans, in the maximum prices of soya flour from £61 7s. 6d. to £79 10s. 0d. per ton on a scale of 28 lb. or more, and from 8½d. to 10½d. per lb. on a sale of less than 28 lb.

## Labelling of Food

An Order amending the Labelling of Food Order, 1946, came into force on May 1, 1947. The Labelling of Food Order applies to all foods packed in advance ready for retail sale in a wrapper or container, unless specifically exempted. The purpose of the new amending Order is to add to the list of exemptions fresh fruit and vegetables (except potatoes) and single toffee apples, since it has been found impracticable for these items to be labelled in accordance with the provisions of the main Order.

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## Copenhagen Exhibition

Arrangements have been made, with the approval of His Majesty's Government and the Danish Government, to hold an All-British Exhibition in Copenhagen in September, 1948.

The Exhibition will be organised by the British Import Union of Copenhagen in collaboration with the Federation of British Industries, as was done in the case of the successful British Exhibition in Copenhagen in 1932.

Steps to organise the Exhibition are now being taken and, as soon as the necessary plans and other information for intending exhibitors are completed, a further announcement will be made.

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## Cocoa Prices

Following the increase in the price of raw cocoa, which was recently announced, an Order has been made amending the Chocolate, Sugar Confectionery and Cocoa Products (Control and Maximum Prices) Order, 1944 (S.R. & O. 1944, No. 451), whereby the maximum price of cocoa butter is increased from 1s. 7d. to 2s. 11d. per lb., and of chocolate couverture by amounts varying from 3d. to 9¼d. per lb. according to grade.

Approval has also been given to an increase in the prices of cocoa powder and drinking chocolate, most brands of which will go up by 6d. and 3d. per lb. respectively.

Many of the ingredients, including sugar, glucose, nuts, and dried milk, which are used in the manufacture both of chocolate and sugar confectionery, have increased in price during recent months. These increases will be partially, but not entirely, offset by reductions in the percentage rates of wholesalers' and retailers' margins which the Minister has directed should be made in consequence of the increased turnover handled by the confectionery trade since the sweet ration was increased from 3 oz. to 4 oz. per week.

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## Edible Gelatine

An Order has been made amending the Edible Gelatine (Control) Order, 1947. The amending Order, which came into force on May 21, 1947, permits the manufacture of edible gelatine by the blending together of two or more gelatines and adds jellied eels to the list of specific foods in the preparation of which gelatine may be used.

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## Ice Cream Ingredients

Applications will be considered for an allowance of rationed ingredients for making ice cream from persons who made ice cream before the war, but who have not hitherto qualified for supplies on the ground that they did not on or before May 15, 1940, establish a claim to have used sugar for ice cream making in the pre-war datum period.

Applications from such pre-war makers should be addressed to the local Food Office.

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## Overseas Grain Trade

An Order, which came into force on May 18, 1947, has been made revoking the Cereals and Cereal Products (Licensing and Control) (Dealings Abroad) Order, 1944.

Since the outbreak of war, transactions abroad by grain trade firms domiciled in the United Kingdom have been controlled under the Cereals and Cereal Products (Requisition and Control) Order, No. 1035 of 1939 and its successor the Cereals and Cereal Products (Licensing and Control) (Dealings Abroad) Order, No. 1035 of 1944. To assist the United Kingdom grain trade to extend their operations in the international market, the restrictions imposed by the Control Orders are removed by the revocation of the 1944 Order. To the same end, subject to the requirements of the Defence (Finance) Regulations, 1939, the Bank of England will provide exchange facilities under arrangements about which grain trade firms can obtain information from their banks or from the National Federation of Corn Trade Associations, 24, St. Mary Axe, London, E.C.3.

The new arrangements do not apply to the importation of cereals and cereal products into the United Kingdom. The Ministry of Food will continue to be the sole importer of these commodities.

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## Tomato Purée

Consideration will now be given to applications for import licences for concentrated tomato purée, pulp, or paste for manufacturing purposes only, from the following countries:

Australia.
South Africa, and
European countries, with the exception of Hungary and Italy.

Imports from other countries will continue to be handled by the Ministry as heretofore.

Licences will be granted to licensed manufacturers only, and applications should be sent in duplicate on the Board of Trade Form ILD/A to the Canned Fruit and Vegetables Division, Ministry of Food, Portman Court, London, W.1.

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## Australian Crawfish Imports

Subject to the granting of import licences, traders may import frozen crawfish (whole fish, boiled) from Australia. Four hundred tons are expected to be available during the season which ends in October, 1947. Importation will not be restricted to pre-war importers. Applications for import licences should be addressed to the Board of Trade, Import Licensing Department, 189, Regent Street, London, W.1.

Traders requiring further information are advised to approach the Senior Government Trade Commissioner, Australia House, Strand, London, W.C.2.

## Pepper Imports

In agreement with the President of the Board of Trade, the Ministry of Food announce that a further allocation of import quotas is to be made for black or white pepper to firms at present eligible, and the Ministry will be prepared to consider applications for import licences at prices approximating to current levels.

In addition, applications for licences to import Indian pepper will be entertained from recognised importers who do not hold import quotas, but must be supported by evidence that the Government of India has granted an export licence.

Applications for licences should be sent in duplicate on the Board of Trade Form ILD/A to the Canned Fruit and Vegetables Division, Ministry of Food, Portman Court, London, W.1.

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## Marking of Salmon

An investigation of the migrations of salmon has been instituted by the International Council for the Exploration of the Sea.

A number of adult salmon and sea trout are accordingly to be marked in the North Sea off the mouth of the Yorkshire Esk during the months of May, June, July, and August. Fish will be caught and released alive after a distinctive mark, consisting of a small celluloid tube containing a slip of paper with instructions as to return of marks, has been attached to the dorsal fin by a loop of silver wire.

It is anticipated that a proportion of these marked fish will be recaptured during the current season off the East coast and in the adjoining rivers. Salmon fishermen at all stations are invited to co-operate in the scheme by sending particulars of any recaptures to the Fisheries Department of the Ministry, who will pay a reward of five shillings for complete particulars.

This technique of marking wild fish (called "tagging" in America) is very similar to experiments performed with wild birds, and is intended to obtain information about the movements of salmon in the open sea and off our coasts.

## Pickles and Sauces Order, 1947

An Order, which came into force on May 14, 1947, has been made replacing the Pickles and Sauces Order, 1946.

Under the new Order sauce (as well as pickles) is now freed from price control. The containers of pickles and sauce must bear a label showing a recommended retail price as defined in the Order, but the word "recommended" need not appear on the label. Sales of pickles and sauce labelled in compliance with the 1944 or 1946 Orders can continue until specified dates in 1947 and 1948. Records of sales need no longer be kept, but records of manufactures must be kept as before.

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## Export of Kippers and Bloaters

After consultation with the Board of Trade, the Fisheries Departments, and the Herring Industry Board, the Minister of Food has decided to permit the export of limited quantities of kippers and bloaters. These quantities will not relate to the increased production of individual processers, but depend in total upon the fulfilment of the home market demands. It is anticipated that from the kipper and bloater production during the period June to November, 1947, both months inclusive, it should be possible to support applications for licences to the extent of 2,000 tons of kippers and 500 tons of bloaters. The Herring Industry Board have therefore been authorised by the Minister to support applications for export licences within those limits.

Application forms for export licences can be obtained from any Customs Office or from the Export Licensing Department, Board of Trade, Stafford House, King William Street, London, E.C.4. The applications when completed should be sent to the Herring Industry Board, 1, Glenfinlas Street, Edinburgh, 3, who will forward it to the Board of Trade with their recommendations. A condition of the grant of the licence is that kippers and bloaters to be exported will be subject to inspection by the Herring Industry Board.

## Meat and Offal Prices

Mutton and lamb cuts imported from South America and issued against the ration are, if found unsuitable for the retail trade, re-classified and issued for manufacturing purposes to Group I and Group IV butchers. W.M.S.A.'s have been authorised and instructed, as from May 15, 1947, to sell such cuts as are re-classified and disposed of to manufacturers at 6d. per lb.

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## Oil and Meal from Herrings

Arrangements have now been made for processing surplus herrings into oil and meal during the main fishing seasons in 1947. The scheme will be similar to that operated during the last East Anglian season, but on a larger scale. In view of the extreme shortage of oils and fats the Government have decided to offer to buy from the fishermen the whole of their catch surplus to home and export requirements, at a price of 30s. per cran, subject only to regulation of the fishing by the Herring Industry Board.

The scheme will operate during the herring fishing seasons off the Shetland Islands, the Moray Firth, the North-East coast of England, and the East Anglian coast. Arrangements for reduction will, where practicable, be made at other herring ports. A number of existing reduction factories will be used, including the plant in the Shetland Islands operated under the auspices of the Herring Industry Board.

In order to demonstrate the contribution which herring oil can make to the country's food supplies, a special sample of margarine has been manufactured in which refined hardened herring oil has been blended, and this was distributed during the ration period which began on June 22 in the main herring ports on the Moray Firth, in East Anglia, and in the Shetland Islands.

The Committee of Enquiry, which is examining the possibilities of developing the reduction of herrings to oil and meal in this country, has not yet completed its investigations, but it is hoped to make a further announcement shortly.

# Information and Advice

## Table Jelly Manufacture

B.1828. *We would appreciate information on the Ministry of Food test and specification for table jellies.* (London.)

The following are the conditions governing the manufacture of table jellies:

Any table jelly tablet or table jelly compounds manufactured shall only be sold pre-packed in a container of one-pint size, that is to say:

(*a*) in the case of table jelly tablets, a container containing a tablet of not less than 5 oz. net weight.

(*b*) in the case of table jelly compounds, a container containing not less than 2½ oz. net weight of the product.

Table jelly crystals manufactured under the authority of this Licence shall only be sold either:

(*a*) pre-packed in a container or one-pint size, that is to say, containing not less than 3 oz. net weight of the product, or

(*b*) in a container containing 7 lb. or a multiple of 7 lb. net weight of the product.

Table jelly tablets shall comply with the following specifications:

(*a*) They shall consist of sugar, gelatine, or other jelly-forming material (other than farinaceous products) with other ingredients (not being farinaceous products) to form a tablet which, when made up with water, produces a jelly table sweet complying with the setting test specified in paragraph 5 of this Schedule.

(*b*) The percentage of soluble solids contained therein shall be not less than 72 per cent. by weight.

(*c*) The percentage of sugar contained therein (all sugar contained in or added to the product being taken into account in whatsoever form the same may have been introduced) shall not be less than 63 per cent.

Table jelly crystals shall comply with the following specification:

(*a*) They shall consist of sugar and gelatine or other jelly-forming material (other than farinaceous products) with or without other ingredients (not being farinaceous products) to form crystals which, when made up with water, produce a jelly table sweet complying with the setting test specified in paragraph 5 of this Schedule.

(*b*) The percentage of sugar contained therein (all sugar contained in or added to the product being taken into account in whatsoever form the same may have been introduced) shall be not less than 84 per cent.

Table jelly compounds shall comply with the following specification:

(*a*) They shall consist of sugar and gelatine or other jelly-forming material with other ingredients to form a product which when made up with milk, produces a jelly table sweet complying with the setting test specified in paragraph 5 of this Schedule.

(*b*) The percentage of sugar contained therein (all sugar contained in or added to the product being taken into account in whatsoever form the same may have been introduced) shall be not less than 50 per cent.

(*c*) The percentage of starch if any contained therein shall not exceed 20 per cent. by weight.

The setting test referred to states that if the product is pre-packed, six one-pint packages thereof, or, if the product be not pre-packed, 22½ oz. thereof in the case of crystals shall be made into a jelly or jelly compound (as the case may be) by the addition of water in the case of table jelly tablets or crystals, or of milk in the case of table jelly compounds (in either case approximately 88° C.), the total volume to amount to six pints. 85 mls. of the solution shall be immediately introduced into each of six beakers of approximately 5 c.m. internal diameter and the beakers cooled for 18 hours in a water bath maintained at 16° C. + 1° C. At the end of this period the jellies shall be turned out on to a plate or dish by the following method. Each beaker shall be immersed in a water bath at approximately 50° C. for eight seconds. Upon removal each beaker shall be immediately dried and the contents transferred to a plate or dish by inversion of the beaker. If not less than four out of the six jellies or jelly compounds shall retain for 30 minutes the general shape of the beaker and shall not at the end of such a period have collapsed or split so as to alter their shape then the setting test shall be deemed to have been satisfied.

## Information Supplied

B.1754. *Manufacturers of glass bottles, cardboard discs, metal or other bottle caps.* (S. Africa.)

B.1755. *Suppliers of cardboard tubes.* (Somerset.)

B.1756. *Address of firm manufacturing filter pumps for the purpose of clearing sludge out of liquids.* (London.)

B.1762. *Manufacturers of equipment used in the production of potato crisps, and of machinery for shredding refined suet.* (Lancs.)

B.1764. *The preservation of fruit mincemeat, and the packing of diced citrus fruit.* (S. Africa.)

B.1765. *Manufacturers of packaging machinery.* (Australia.)

B.1767. *Name and address of the firm manufacturing food stabilisers.* (Belgium.)

B.1769. *Details of the manufacture of caramel colouring.* (London.)

B.1770. *Advice on the methods of brining cucumbers.* (Denmark.)

B.1772. *Manufacturers of drying machines suitable for eliminating the moisture content of sawdust.* (Lincs.)

# Recent Patents

*These particulars of new patents of interest to readers have been selected from the "Official Journal of Patents," and are published by permission of the Controller of H.M. Stationery Office. The journal can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, price 1s. weekly (annual subscription £2 10s.).*

**Abstract of Recent Specification**

## Improvements to Machines for Labelling Bottles and Other Containers

The present invention aims at increasing the speed of labelling by the use of multiple label-carrying pairs of blades integrally connected to a revolving turret similar to those used in stationary labelling machines, the several pairs of blades enabling the various steps to take place at the same time and independently of each other, and, in order that this arrangement may be used on a member having a reciprocating motion, the return motion of the turret-carrying slide for causing rotation of this turret has been utilised.

Further, in addition to increasing the speed of production, the parts of the machine have been arranged so that the upkeep of the latter be made easy and the parts may be protected against paste or the like splashes which are likely to take place in a labelling machine and are injurious to its good working.

This result has been obtained by causing the sliding of the labelling station assembly on horizontal guides which are connected to a stationary frame only at one end of said guides so that said assembly may be suspended in cantilever fashion, not being directly supported from the ground.

*581,362. "Brass-Cav" S.A.R.L.*

**Specifications Published**

*Printed copies of the full Published Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, at the uniform price of 1s. each.*

584,999. CARR AND CO., LTD., and CARR, R. N.: Method of and means for the manufacture of unleavened bread or matzo.

585,042. THOMAS, S. A.: Butter serving machines.

585,058. BIBBY AND SONS, LTD., J., and IBISON, A.: Separation-out of protein or material rich in protein from materials having a protein content.

585,067. BASS, RATCLIFFE AND GRETTON, LTD., and SLATOR, A.: Malt extract syrup and the use thereof in brewing.

585,153. COOPER, MCDOUGALL AND ROBERTSON, LTD., and HOLLOWAY, W. R.: Apparatus for filling bottles and other containers.

585,191. PRESTON AND THOMAS, LTD., and CORNELIUS, R. C.: Potato chipping machines.

585,282. BRITISH THOMSON-HOUSTON CO., LTD., and STANWORTH, J. E.: Heat-resisting glass.

585,304. UNITED WHALERS, LTD., and UNDERWOOD, A. J. V.: Process for the extraction of oil from liver.

585,388. KIRKHAM, R. S.: Closures for bottles and the like.

585,417. NOUPEX, LTD., and KORFF, F. C.: Glove for use in removing skin from potatoes and like root crops.

## Trade Marks

*The list of trade marks of interest to readers has been selected from the "Official Trade Marks Journal" and is published by permission of the Controller of H.M. Stationery Office. The journal can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, price 1s. weekly (annual subscription £2 10s.).*

**PAGEANT.**—637,273. Dried, cooked and canned fruits and vegetables. **Henry W. Peabody and Co. of London, Ltd.**, 16, Eastcheap, London, E.C.3.

**BANQUET.**—637,579. Dried fruits, dried beans, dried peas, canned fish, canned fruits, canned tomatoes, condensed milk, pickles, ox tongues, lunch tongues, corned beef, brisket of beef, jellied veal, brawn, cheese, lard, bacon, cooked hams, cooked bellies of pork, canned beef and tongue and canned turkey and ham, all for sale in the Counties of Durham and Northumberland, and in the North Riding of Yorkshire. **Pearman and Corder, Ltd.**, Phœnix Buildings, Union Street, Sunderland.

**PANTINS.**—638,028. Jams, marmalade, lemon cheese, mincemeat, jellies (for food), canned fruits, and canned vegetables, all for sale in England. **Lipton, Ltd.**, 186 and 188, City Road, London, E.C.1.

**VANITY FAIR.**—641,176. Chocolate and confectionery (not medicated). **Dunn and Company (Sunderland), Ltd.**, Mayfair Building, Burn Park, Sunderland, County Durham.

## New Companies

**Colin Robertson, Limited.** (427335.) 74A, Regent Street, W. 1. To take over bus. of a baker and dairyman carried on at 8, Gourlay Street, Glasgow, by Colin Robertson. Nom. cap. £1,000 in £1 shares. Dirs.: C. Robertson, 8, Gourlay Street, Glasgow; B. Robertson and B. Robertson, addresses not stated.

**Ted Warner and Sons, Limited.** (427403.) 107. Westgate Street, Gloucester. To take over business of meat traders carried on as "Ted Warner" at Westgate Street, Gloucester, and as "Alfred E. Warner" at Eastgate Street, Gloucester. Nom. cap.: £4,000 in £1 shares. Permt. dirs.: E. Warner, The Cottage, Churchdown, nr. Gloucester; A. E. Warner, The Lawn, Longford, nr. Gloucester; M. M. Warner, The Cottage, Churchdown, nr. Gloucester.

**Thompson and Norris (Midlands), Limited.** (427405.) 2, Guildhall Chambers, Basinghall Street, E.C.2. To carry on bus. of and dealers in corrugated fibreboard packing cases, etc. Nom. cap.: £25,000 in £1 shares. Dirs.: K. N. Beach, Seven Trees, Silverdale Avenue, Walton-on-Thames; W. R. Tomlinson, 21, Hillbrow, Richmond Hill, Surrey.

**European Animal and Food Products Company, Limited.** (427758.) Nom. cap.: £1,000 in £1 shares. Dirs.: not named. Subs.: L.B. Piper, 5, Thavies Inn, E.C.1 (clk.); E. A. Cutting, 19, Northernhay Walk, Morden, Surrey.

**Twigg (Boxes), Limited.** (427788.) To take over bus. of box manufacturer carried on at The Docks, Gloucester, by Percy Twigg. Nom. cap. £4,000 in £1 shares. Dirs.: P. Twigg, The Docks, Gloucester; F. J. Fish, 90, Queen Victoria Street, E.C.4.

**H. and J. Products Company, Limited.** (427826.) 59, Meadow Road, Leeds, 11. To carry on bus. of manufacturers of and dealers in foodstuffs, etc. Nom. cap.: £600 in £1 shares. Dirs.: Mrs. E. Hargreaves and N. Hargreaves, Parkville, Middleton Park Avenue, Leeds, 10; H. F. Johnston and A. F. Johnston, 47, Montague Crescent, Leeds, 8.

**L. and D. Sparkes, Limited.** (427844.) 98, Station Road, Burnham-on-Crouch, Essex. To take over the bus. carried on by A. Sparkes at Burnham-on-Crouch and to carry on bus. of butchers, etc. Nom. cap. £6,000 in £1 shares. Permt. dirs.: A. C. Sparkes, 12, Fernwood Avenue, Holland-on-Sea; L. A. Sparkes, 100, Station Road, Burnham-on-Crouch; D. C. Sparkes and Dora E. Pudney.

*Taken from the Daily Register, compiled by Jordan and Sons, Limited, Company Registration Agents, 116, Chancery Lane, London, W.C. 2.*